DOCUMENT RESUME

ED 399 011 PS 024 311

TITLE	Transformations: Kentucky's Curriculum Framework. Volumes I and II.
INSTITUTION	Kentucky State Dept. of Education, Frankfort.
PUB DATE	Sep 95
NOTE	534p.
AVAILABLE FROM	Kentucky Department of Education, 19th Floor, Capital Plaza Tower, 500 Mero Street, Frankfort, KY 40601 ($40 in-state; $60 out-of-state).
PUB TYPE	Guides - Classroom Use - Teaching Guides (For Teacher) (052)
EDRS PRICE	MF02/PC22 Plus Postage.
DESCRIPTORS	*Curriculum Design; *Curriculum Development; Curriculum Research; *Educational Change; *Educational Improvement; Educational Innovation; Elementary Secondary Education; Instructional Development; Material Development; School Restructuring; State Curriculum Guides; Teaching Guides
IDENTIFIERS	*Curriculum Implementation; Curriculum Theories; Kentucky; *Kentucky Education Reform Act 1990

ABSTRACT

This guide is intended to provide direction to Kentucky districts and schools as they develop local curricula designed to meet the state's six learning goals and academic expectations as identified in the Kentucky Education Reform Act (KERA). Specifically, the guide provides direction to local curricula development teams; effects change by establishing capacity in districts and schools; and provides support as districts and schools plan and initiate the transformation process. Volume one of the guide contains the goals, academic expectations, and their expansions. Each academic expectation has one or more accompanying pages that include: (1) definitions of the academic expectations which indicate student progress toward the outcome; (2) ideas for making connections to real-life situations; (3) samples of topics and processes within content areas; (4) teaching and assessment strategies; (5) ideas for incorporating community resources; (6) activities to involve students; and (7) reflections on academic expectations. Volume two focuses on the main processes which local districts and schools will use to develop curriculum and instruction to meet local needs. This volume addresses: (1) transforming the learning environment to foster change; (2) alternative uses of school time to address curricular needs; (3) local curriculum development guide; (4) teachers' questions about implementation; and (5) resources which identify teaching and assessment strategies, sources, models, and key readings. (Author/SD)

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Transformations:

Kentucky's Curriculum Framework

Volume I
September 1995

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Publishing Information

Revised in 1995 by
Kentucky Department of Education
Frankfort, Kentucky

Graphic Design/Production
The Stone Advisory
Lexington, Kentucky

Photographer
Rick McComb
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Printed with state funds

Transformations:

Goals/Academic Expectations/ Expansions

Preface

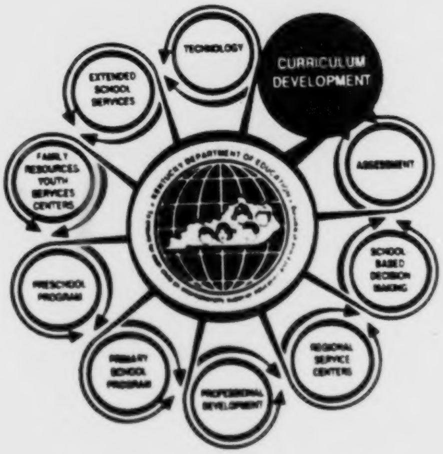
"Each child, every child, in this Commonwealth must be provided with an equal opportunity to have an adequate education."

Supreme Court Opinion
Rose v. Council for Better Education, Inc.

Central to educating all children is the design and implementation of challenging, stimulating learning experiences. These emanate from a curriculum focused on Kentucky's learner goals and academic expectations, instructional approaches which actively engage students, and powerful assessments which identify learning growth and provide direction for future instruction.

KRS 158.6451 (4) directed the Kentucky Department of Education to design a curriculum framework which addresses Kentucky's goals, academic expectations, and assessment strategies and provides "....direction to local districts and schools as they develop their curriculum." *Transformations: Kentucky's Curriculum Framework* addresses that challenge. The two volumes offer further explanation of the academic expectations, suggestions on teaching strategies and activities, and multiple resources to assist with the development of curriculum and instructional units.

While the use of this framework is not mandated, it has been designed to provide guidance and assistance in the development of local curriculum. Designing a curriculum which prepares each student to be successful in life becomes a challenge and responsibility for all of Kentucky's educators, but it is just the first step. The implementation of that curriculum is the critical component in assuring that each child achieves the six learning goals identified in the Kentucky Education Reform Act (KERA).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SCHOOL BASED DECISION MAKING
PRESCHOOL PROGRAM
PRIMARY SCHOOL PROGRAM
PROFESSIONAL DEVELOPMENT
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Mission

The mission of the Kentucky Department of Education, as the national catalyst for educational transformation, is to ensure for each child an internationally superior education and a love of learning through visionary leadership, vigorous stewardship, and exemplary services in alliance with schools, school districts, and other partners.

Philosophy

These beliefs were used as guiding thoughts in the development of the curriculum framework.

WE BELIEVE

All children can learn at high levels, and they

...possess a curiosity and desire to learn.
...respond positively to success and enthusiasm.
...develop and learn at different rates.
...demonstrate learning in different ways.
...learn by being actively involved, by taking risks, and by making connections.

Successful schools are for students, and they

...expect a high level of achievement.
...provide the time and instruction to achieve student success.
...provide connections with home and community experiences.
...ensure a safe, positive environment.
...create opportunities to explore and grow.

Effective instruction facilitates learning, and it

...addresses identified academic expectations.
...assures success and risk taking.
...employs a variety of effective techniques to address learning diversity.
...aligns curriculum, instruction, and assessment.
...connects curricular offerings to the life experiences of students.
...encourages self-direction and life-long learning.

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Acknowledgments

The following people have given time and energy toward the development of this curriculum framework. Without their contributions, this document could not have been written. Listed are their school assignments at the time of their participation in the framework development.

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Special appreciation is expressed to April Rooks DeLuca, to local district technology coordinators, to curriculum alliance members, and to local district personnel who responded to the plans for this document.

Sincere thanks to Robin Fogarty for her writing of the *Reflections*, her support, and her advice.

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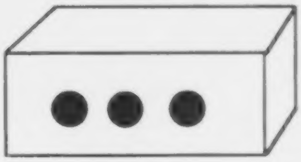
Volume I

Introduction

"Please, sir, draw me a sheep." With these simple words the Little Prince initiates his relationship with the aviator in St. Exupéry's *The Little Prince**. The Little Prince's incessant demand of the pilot to draw a sheep is finally met with some feeble attempts. One sheep is too old, another too sick, and another won't do because it is a ram. Finally, in desperation the pilot hands the Little Prince a sketch of a box with three holes drawn in the side. "Here," he says, "the sheep that you want is inside." The Little Prince's face lights up, and he says that is exactly the sheep he needs.*



The sheep, drawn by the aviator, required the Little Prince to use imagination and creativity to see his vision. So, too, *Transformations: Kentucky's Curriculum Framework* is a "sheep" that can be fully seen and realized only through the vision and leadership of the local school district, school personnel, and school councils. The main function of the framework is to help districts and schools design the curriculum they envision for their students.

The framework is designed for all students. While the student expectations are constant, the delivery mechanisms such as instructional strategies, resources, and amount of time will vary according to individual student needs.

Purpose

Transformations: Kentucky's Curriculum Framework is the response to the KRS 158.6451(4) which addresses the requirements of the curriculum framework. It "...shall provide direction to local districts and schools as they develop curriculum." A district's or school's curriculum should reflect local conditions, needs, and beliefs. It is not mandatory that this curriculum framework be used; however, it does offer assistance as local curricula are designed to meet the state's six learning goals and academic expectations. The document itself has undergone a transformation since its inception and will continue to change as KERA progresses.

What is curriculum?

The real curriculum is the one experienced by the student. It is, therefore, imperative that a written curriculum be a coherent, organized set of instructional opportunities which focuses on student learning. It must provide rich, engaging experiences connected to real-life situations.

What is a curriculum framework?

A framework presents parameters to assist in the development of curriculum. It is not a curriculum guide nor is it designed to be used as a tool for the delivery of instruction. It can serve as a major resource for the creation of districts' and schools' curricula, instruction, and performance assessments and for professional development.

Kentucky's Curriculum Framework

More than 100 teachers, counselors, administrators, regional service center consultants, and university personnel were significantly involved in the development of this framework. It is truly Kentucky's curriculum framework.

This document is designed to

- provide direction to local teams of teachers, administrators, media/library specialists, students, parents, and community representatives as they develop curriculum unique to their districts and schools.

- effect change by establishing capacity in districts and schools.

- provide support as districts and schools plan and initiate activities that undergird the transformation process.

The curriculum framework is made up of two volumes which complement each other in the development of local curricula.

Volume I contains the goals, academic expectations, and their expansions. Each academic expectation has one or more accompanying pages that include the following:

- **Demonstrators** are further definitions of the academic expectations which indicate student progress toward the outcome. Local curriculum writers may choose to delete, add to, or use these demonstrators in their entirety. Although the demonstrators are identified as appropriate for elementary, middle, and high school levels, they are not grade level specific. The demonstrators should be read from the bottom to the top of each column, but are not to be considered linear and need not be demonstrated sequentially. This structure was designed to reflect the student's growth toward the academic expectations throughout the educational experience.

- **Learning Links** are ideas for making connections to real-life situations and other content areas.

- **Related Concepts** are samples of topics and processes within the content areas; they are found only in Goal 2.

- **Teaching/Assessment Strategies** are samples of techniques that might be used to transform classroom instructional/assessment practices.

- **Ideas for Incorporating Community Resources** suggest resources available throughout Kentucky to extend the classroom beyond the school building.

- **Activities** are suggestions which involve students in engaging instructional/assessment experiences. They are coordinated with the demonstrators and state assessments. In Goal 2, there are activities which show how the core concepts can be applied across the curriculum. Also, the "Variations on a Theme" show how a single theme may be woven through the content areas.

- **Reflections** explain why the academic expectation is important for the students to achieve.

Volume II centers on the main processes which local districts and schools will use to develop curriculum and instruction that meet their needs. It includes models, samples, examples, and guides to enable school-based councils, teams of teachers, and other curriculum writers to turn their own vision into reality. Volume II contains the following sections:

- **Transforming the Learning Environment** suggests ways in which the learning environment might be changed to foster sustained learning for all students and provides resources which address this aspect of curriculum development and instructional design.

- **Alternative Uses of School Time** provides ideas and examples of changed school schedules and calendars. The ideas are based upon the premise that a school's schedule should be established around curricular needs, rather than around a calendar or clock.

- **Local Curriculum Development Guide** suggests steps to follow as curriculum developers work through the processes of designing curriculum and instruction.

- **Bringing It All Together** helps to answer the teachers' questions, "What do I do now?" It presents one teacher's response to the demands for changing classroom practices, such as implementing standards-based instruction, developing culminating performances, and designing scoring rubrics.

- **Resources** identify teaching/assessment strategies, instructional and community resources, model-teaching sites, and key readings that will prove useful.

KERA Strands Support Transformation

As local curriculum committees and teams begin to develop curriculum, it is important that a holistic approach to instruction be used. Social, emotional, aesthetic, physical, and intellectual needs of students must be addressed in order to provide the optimum environment for learning.

The following components of the Kentucky Education Reform Act (KERA) ensure for each child equal educational opportunities that focus on preparing the whole child for life. These components of KERA stress the connections to the learning experiences of students.

- **Preschool programs** support at-risk students by providing a curriculum to prepare them for success in primary school.
- **Primary School programs** provide children with non-competitive classrooms using developmentally appropriate practices.
- **Kentucky's assessment program (KIRIS)** reflects real-life learning experiences and holds districts/schools accountable for student learning.
- **Professional development** of administrators and teachers is central to transforming the learning environment and is critical to the success of KERA.
- **Regional Service Centers** are local, instructional resources for school districts and schools.
- **School-based councils** composed of teachers, parents, and administrators share decision-making on issues affecting curriculum, instruction, and assessment.
- **Expanded technology (KETS)** supports curriculum, assessment, and professional development; enhances communication; and facilitates administrative support services.
- **Extended School Services** programs offer expanded learning opportunities for students.
- **Family Resource and Youth Service Centers** support curriculum and instruction by addressing students' needs for physical and emotional wellness.

Transformations: Kentucky's Curriculum Framework is an evolving document. It will continue to be developed and refined as the implementation of KERA changes the way instruction is implemented and evaluated. To touch all children and facilitate effective instruction, open it, use it, and begin to transform the learning environment.

Kentucky's Learning Goals And Academic Expectations

The centerpiece of Kentucky's education reform effort is its vision of what students should know and be able to do as a result of their school experience. Every aspect of the reform movement is designed to promote student attainment of these goals and to measure our progress in helping them to do so.

Assumption underlying KERA

All students are capable of learning.

The expectations for students are set forth as the six learning goals of KERA. These goals led to the development of the academic expectations that characterize student achievement of the goals. *All* Kentucky students are expected to achieve the goals and academic expectations.

1. Students are able to use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives.

1.1 Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.

1.2 Students make sense of the variety of materials they read.

1.3 Students make sense of the various things they observe.

1.4 Students make sense of the various messages to which they listen.

1.5-
1.9 Students use mathematical ideas and procedures to communicate, reason, and solve problems.

1.10 Students organize information through development and use of classification rules and systems.

1.11 Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.

1.12 Students speak using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.

1.13 Students make sense of ideas and communicate ideas with the visual arts.

1.14 Students make sense of ideas and communicate ideas with music.

1.15 Students make sense of and communicate ideas with movement.

1.16 Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.

2. Students shall develop their abilities to apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, practical living studies, and vocational studies to what they will encounter throughout their lives.

Science

2.1 Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

2.2 Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.

2.3 Students identify and analyze systems and the ways their components work together or affect each other.

2.4 Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.

2.5 Students understand that under certain conditions nature tends to remain the same or move toward a balance.

2.6 Students understand how living and nonliving things change over time and the factors that influence the changes.

Mathematics

2.7 Students understand number concepts and use numbers appropriately and accurately.

2.8 Students understand various mathematical procedures and use them appropriately and accurately.

2.9 Students understand space and dimensionality concepts and use them appropriately and accurately.

2.10 Students understand measurement concepts and use measurements appropriately and accurately.

2.11 Students understand mathematical change concepts and use them appropriately and accurately.

2.12 Students understand mathematical structure concepts including the properties and logic of various mathematical systems.

2.13 Students understand and appropriately use statistics and probability.

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Social Studies

2.14 Students understand the democratic principles of justice, equality, responsibility, and freedom and apply them to real-life situations.

2.15 Students can accurately describe various forms of government and analyze issues that relate to the rights and responsibilities of citizens in a democracy.

2.16 Students observe, analyze, and interpret human behaviors, social groupings, and institutions to better understand people and the relationships among individuals and among groups.

2.17 Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.

2.18 Students understand economic principles and are able to make economic decisions that have consequences in daily living.

2.19 Students recognize and understand the relationship between people and geography and apply their knowledge in real-life situations.

2.20 Students understand, analyze, and interpret historical events, conditions, trends, and issues to develop historical perspective.

2.21 (Incorporated into 2.16)

Arts and Humanities

2.22 Students create works of art and make presentations to convey a point of view.

2.23 Students analyze their own and others' artistic products and performances using accepted standards.

2.24 Students have knowledge of major works of art, music, and literature and appreciate creativity and the contributions of the arts and humanities.

2.25 In the products they make and the performances they present, students show that they understand how time, place, and society influence the arts and humanities such as languages, literature, and history.

2.26 Through the arts and humanities, student recognize that although people are different, they share some common experiences and attitudes.

2.27 Students recognize and understand the similarities and differences among languages.

2.28 Students understand and communicate in a second language.

Practical Living

2.29 Students demonstrate skills that promote individual well-being and healthy family relationships.

2.30 Students evaluate consumer products and services and make effective consumer decisions.

2.31 Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.

2.32 Students demonstrate strategies for becoming and remaining mentally and emotionally healthy.

2.33 Students demonstrate the skills to evaluate and use services and resources available in their community.

2.34 Students perform physical movement skills effectively in a variety of settings.

2.35 Students demonstrate knowledge and skills that promote physical activity and involvement in physical activity throughout lives.

Vocational Studies

2.36 Students use strategies for choosing and preparing for a career.

2.37 Students demonstrate skills and work habits that lead to success in future schooling and work.

2.38 Students demonstrate skills such as interviewing, writing resumes, and completing applications that are needed to be accepted into college or other postsecondary training or to get a job.

3. Students shall develop their abilities to become self-sufficient individuals.*

4. Students shall develop their abilities to become responsible members of a family, work group, or community, including demonstrating effectiveness in community service.*

5. Students shall develop their abilities to think and solve problems in school situations and in a variety of situations they will encounter in life.

5.1 Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.

5.2 Students use creative thinking skills to develop or invent novel, constructive ideas or products.

5.3 Students organize information to develop or change their understanding of a concept.

5.4 Students use a decision-making process to make informed decisions among options.

5.5 Students use problem-solving processes to develop solutions to relatively complex problems.

***Goals 3 and 4 are included in Kentucky statute as learning goals, but they are not included in the state's academic assessment program.**

6. Students shall develop their abilities to connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources.

6.1 Students connect knowledge and experiences from different subject areas.

6.2 Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences.

6.3 Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

Transformations:

Goal 1

Use Basic Communication and Mathematics Skill

Format Explanation

The demonstrators further define the academic expectations and provide benchmarks to indicate student progress toward the academic expectations. Demonstrators written at the bottom of each section are less complex than those at the top; however, all levels of Bloom's Taxonomy may be demonstrated by students of any age.

The academic expectations were adopted by the State Board for Elementary and Secondary Education; they indicate what students are expected to demonstrate

The learning goals change the schools' curricula to focus on academic expectations.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.28: Students understand and communicate in a second language.

Learning Links: Fluency / Translation / United Nations / Dialect / Diplomacy / Multinationals / Slang / Derivation / Movies / Interdependence / Travel / Trade / Machine Translation

Related Concepts: Listening / Speaking / Writing / Reading / Culture

Elementary Demonstrators	***Middle School Demonstrators***	***High School Demonstrators***
• Communicate basic ideas in a second language. • Respond to a discourse on a specific topic when listening to a second language. • Recognize basic ideas from text written in a second language. • Practice writing simple messages using a second language. • Listen to and imitate a variety of languages. • Identify some important people, holidays, and geographic areas.	• Communicate opinions on a specific topic in a second language. • Listen to and interpret the main ideas of a discourse in a second language. • Communicate simple ideas in writing in a second language. • Read and interpret brief passages written in a second language. • Identify some important dates, events, and people, and discuss their significance.	• Communicate complex ideas in real-life situations in a second language. • Analyze and respond to topics in an extended discourse offered by speakers using native-like discourse strategies in a second language. • Communicate complex ideas in writing in a second language. • Analyze written text and make appropriate inferences in a second language. • Handle routine social situations. • Discuss the significance of the geography, history, and political contributions of the target culture.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

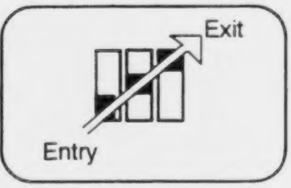
Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Checklist, Portfolio Development, Self-assessment • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Interviews, Debates, Creative Problem Solving, Formulating Models, Role-play, Simulation • **Technology/Tools**: Distance Learning, Interactive Video, Computers, Multimedia, Puppets, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Access public and private library collections of foreign language film, video, and print material.
- Interview local foreign language speakers, including teachers and students, Peace Corp volunteers, missionaries, and migrant workers.
- Identify and visit local businesses (e.g., import stores, travel agencies, and restaurants) that have foreign clients.
- Find sources for foreign videos, cookbooks, and objects such as money, advertisements, and brochures.

The learning links suggest real-life applications and connections across other content areas.



The teaching/assessment strategies suggest instructional approaches and can be used across disciplines.

Ideas are provided on how to use community resources to enhance instruction.

The related concepts (in Goal 2) are topics and processes that might be included in the instructional unit.

Format Explanation

The academic expectation statement is presented in an abbreviated form to communicate its main idea.

The suggested activities that further clarify the academic expectation and demonstrators.

The activities for **Goals 1, 3-6** are designed to be integrated throughout each discipline.

Core Concept: Accessing Sources

Sample Elementary Activities

- Watch a news broadcast on television and retell it for a student audience. P
- Create and video broadcast your own news program. PE
- Interview diverse people from the community about job responsibilities. Create a database about careers. PE, P
- Telephone three different grocery stores to compare prices of the same products. Create a spreadsheet and a graph of the results. P
- Conduct a CD-ROM search on bears and compile a resource list of "bear facts." P

Sample Middle School Activities

- Establish and use criteria to evaluate a variety of print and non-print materials based on how well they provide the information needed. PE, P
- Examine diverse problems that have statewide implications. Identify and evaluate possible solutions from various sources of information. P
- Interview a city official on regulations surrounding garbage disposal. Prepare a multimedia presentation. PE
- Investigate the reason behind a school rule. Interview the principal, teachers, staff, and students on their opinions of the rule. Organize the information using a database. Videotape a debate of the issue. PE, OE, P

Sample High School Activities

- Use telecommunications to gather information about tuition rates at various colleges, universities, business and technical schools. Compile, using a spreadsheet. PE, P
- Create a database of student support services available in the community. PE, P
- Investigate variables of car insurance rates for students. Analyze, compile, and report findings. PE, P
- Compile information on Kentucky's endangered species. Design and implement a campaign to rescue one of the species. PE, OE, P

Reflections

In a high-tech society, life-long learning is a must if students are to keep pace with the rapid rate of change in their world. To be skilled learners throughout their lives, students must not only be adept at accessing the myriad resources available to them, but also be able to create their own new information. They must become comfortable with both print and non-print sources of data, with electronic communications, and with the more traditional interpersonal skills. These interpersonal skills include conducting interviews, gathering bibliographic sources, conducting systematic searches for data and information, and judging which information is useful and appropriate. Only with repeated practice at researching problems do students gain confidence and skill in accessing the sources they need.

The sample activities suggest a few possibilities for accessing sources. The purpose of the academic expectation is to design student activities that require authentic student research and to structure frequent and varied opportunities for exploring, investigating, gathering, and judging which information is useful and appropriate.

Sources: Naisbitt—Megatrends
Fogarty & Haack—Future World, Future School

The activities illustrate the types of performance events (PE), open-ended (OE), and portfolio (P) assessment tasks that may reflect ongoing, classroom assessment.

Core Concept: Second Language Proficiency

Sample Elementary Activities

- Draw and put foreign language labels on the floor plan of your house or apartment. Include one sentence about each room. PE, P
- Play "Follow the leader" giving all commands in the target language. Use different formats (e.g., game, song) to do this. PE
- Read known stories (e.g., "The Little Red Hen") aloud in the target language. PE
- Correspond with a pen pal in a foreign country where the target language is spoken. Write letters in your own language and read letters in the target language. PE, OE, P
- Sing songs in the target language. PE
- Interview a person who speaks the target language. PE, OE
- Learn a song in American Sign Language and perform the song for an audience. PE

Applications Across the Curriculum

Variations on a theme: Songs or Stories

Language Arts
- Listen to a variety of songs in the target language. PE, OE

Science
- Select a number of songs with the same theme in the target language. PE, OE, P

Mathematics
- Compare the rhythm to the beat of the selected songs in the target language. PE, P

Social Studies
- Make costumes representing the country or countries where the songs of the target language are sung. Wear the costume during the performance. PE, OE

Practical Living
- Using the target language, perform a selection of songs alone, and with a group. PE

Vocational Education
- Create an invitation and program of the songs in the target language for a performance. PE

Reflections

There is an unfortunate joke often heard abroad. "What do you call someone who speaks three languages? Trilingual! What do you call someone who speaks two languages? Bilingual! What do you call someone who speaks one language? American!" It is sad, but true, that students around the globe are required to be well-versed in several languages, while all too frequently students in America's schools are fluent in only one—English.

To target understanding and communicating in a second language as an academic expectation signals a call for change: change from the study of foreign language as an honors elective, to the need for proficiency in a second language as a required element in the education of every student.

The world is a community. As members of a leading society in the Western world, it is only prudent that all students develop the ability to communicate in a second language.

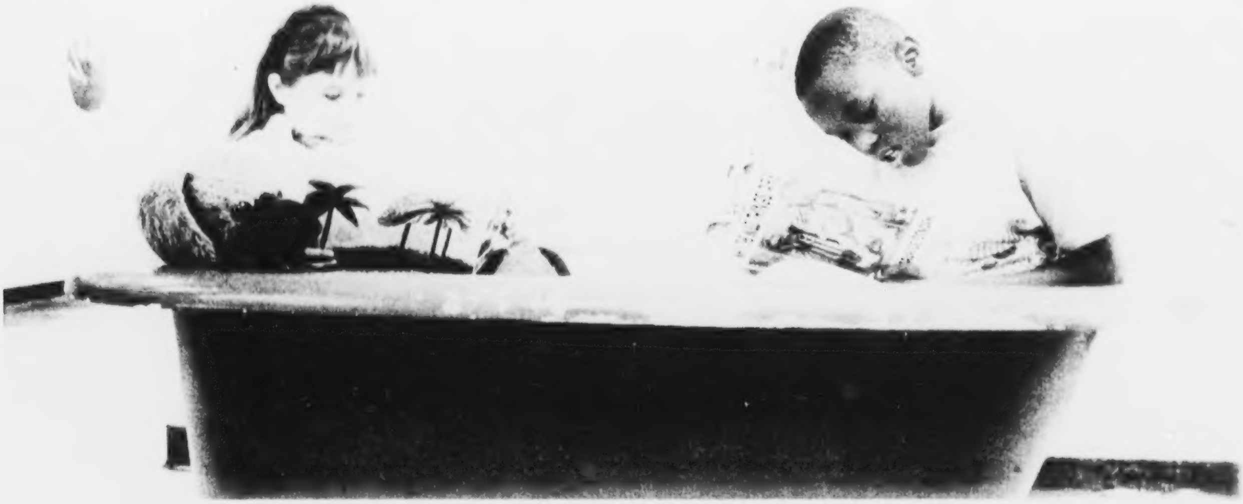
With competence and proficiency in a second language, every student is more fully prepared to be a citizen of the global village. Learning another language is not merely an enhancement to a well-rounded education. Rather, it is a prerequisite for every student as they begin to better understand the world around them.

Goal 2 activities focus on content area. However, many of the concepts can and should be taught across disciplines (e.g., career path, employability attributes, and post-secondary opportunities search should be integrated in content areas other than vocational).

These suggested activities can be used in other disciplines.

Reflections provide insights about why academic expectations are important for students.

Notes



Students at Collins Lane Elementary in Franklin County enjoy reading. **Photo by Rick McComb.**

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.1:

Students use reference tools such as dictionaries, almanacs, encyclopedias, and computer reference programs and research tools such as interviews and surveys to find the information they need to meet specific demands, explore interests, or solve specific problems.

Learning Links: Encyclopedia / Media / Interviews / Surveys / Database / Catalogue / Electronic Bulletin Board / Index / Inventory / Budget / Dictionary / Thesaurus

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use research tools to access and synthesize information.
- Identify and use telecommunication options to obtain information.
- Identify and use print and non-print (e.g., video, CD-ROM) resources to obtain information.
- Question individuals to obtain information.
- Observe to obtain information.
- Manipulate objects to obtain information.

Middle School Demonstrators

- Use a variety of research tools and evaluate the effectiveness of each relevant to a specific need or problem.
- Analyze and compare information accessed from different sources.
- Use a variety of telecommunication resources to obtain information on a specific need or problem.
- Question to obtain information on a specific need or problem.
- Gather information through observation on a specific need or problem.

High School Demonstrators

- Gather, analyze, compile, and use relevant information from a variety of sources on a specific need or problem.
- Use a variety of telecommunication resources to obtain information on a specific need or problem.
- Question a variety of sources to obtain information on a specific need or problem.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Networking • **Continuous Progress Assessment**: Performance Events/Exhibitions • **Problem Solving**: Inquiry, Interviews, Questioning • **Technology/Tools**: Computers, Distance Learning, Manipulatives, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section

Ideas for Incorporating Community Resources:

- Invite a local phone company representative to demonstrate how to use a telephone to obtain information and illustrate telephone adaptations for individuals with disabilities.
- Visit or telecommunicate with local public library, area college library, and State Department for Libraries and Archives.
- Visit local cemeteries to compile data (e.g., birth/death dates, family life expectancy).

Core Concept: Accessing Sources

Sample Elementary Activities

- Watch a news broadcast on television and retell it for a student audience. P
- Create and video broadcast your own news program. PE
- Interview diverse people from the community about job responsibilities. Create a database about careers. PE, P
- Telephone three different grocery stores to compare prices of the same products. Create a spreadsheet and a graph of the results. P
- Conduct a CD-ROM search on bears and compile a resource list of "bear facts." P

Sample Middle School Activities

- Establish and use criteria to evaluate a variety of print and non-print materials based on how well they provide the information needed. PE, P
- Examine diverse problems that have statewide implications. Identify and evaluate possible solutions from various sources of information. P
- Interview a city official on regulations surrounding garbage disposal. Prepare a multimedia presentation. PE
- Investigate the reason behind a school rule. Interview the principal, teachers, staff, and students on their opinions of the rule. Organize the information using a database. Videotape a debate of the issue. PE, OE, P

Sample High School Activities

- Use telecommunications to gather information about tuition rates at various colleges, universities, business and technical schools. Compile, using a spreadsheet. PE, P
- Create a database of student support services available in the community. PE, P
- Investigate variables of car insurance rates for students. Analyze, compile, and report findings. PE, P
- Compile information on Kentucky's endangered species. Design and implement a campaign to rescue one of the species. PE, OE, P

Reflections

In a high-tech society, life-long learning is a must if students are to keep pace with the rapid rate of change in their world. To be skillful learners throughout their lives, students must not only be adept at accessing the myriad resources available to them, but also be able to create their own new information. They must become comfortable with both print and non-print sources of data, with electronic communications, and with the more traditional interpersonal skills. These interpersonal skills include conducting interviews, gathering bibliographic sources, conducting systematic searches for data and information, and judging which information is useful and appropriate. Only with repeated practice at researching problems do students gain confidence and skill in accessing the sources they need.

The sample activities suggest a few possibilities for accessing sources. The purpose of this academic expectation is to design student activities that require authentic student research and to structure frequent and varied opportunities for exploring, investigating, gathering, and judging which information is useful and appropriate.

Sources: Naisbitt—Megatrends
Fogarty & Haack—Future World, Future School

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.2: Students make sense of the variety of materials they read.

Learning Links: Recipes / Advertisements / Schedules / Maps / Budgets / Manuals / Critiques/Movie Reviews / Catalogs / Letters / Applications / Charts / Literature / Newspapers / Magazines / Encyclopedias / Financial Statements

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate an understanding of print materials read in and out of school.
- Respond to reading through a variety of forms (e.g., conversation, art, media, writing).
- Use a variety of strategies (e.g., prior knowledge, predict, question, summarize) to construct meaning.
- Relate reading experiences to life situations.
- Select and use appropriate print materials (e.g., literary, informative, persuasive, practical) for a variety of purposes (e.g., pleasure, information, and practical application).
- Choose print materials for personal interest both in and out of school.
- Exhibit fluency in reading.
- Show interest by listening to and/or reading a multicultural variety of print materials.

Middle School Demonstrators

- Construct meaning and evaluate print materials read in and out of school.
- Interpret reading using different modes of presentation.
- Apply a variety of strategies (e.g., prior knowledge, predict, question, summarize) to construct meaning.
- Relate reading experiences to life situations.
- Analyze appropriate print materials (e.g., literary, informative, persuasive, practical) for a variety of purposes (e.g., pleasure, information, and practical application).
- Select and read print materials for personal interest both in and out of school.

High School Demonstrators

- Construct meaning, elaborate and respond critically to print materials read in and out of school.
- Apply a variety of strategies (e.g., prior knowledge, predict, question, summarize) to construct meaning and evaluate the selected strategy.
- Relate reading experiences to life situations.
- Select and use appropriate print materials (e.g., literary, informative, persuasive, practical) for specific purposes (e.g., pleasure, information, and practical application).
- Select and read print materials for personal interest both in and out of school.

Sample Teaching/Assessment Strategies:

Collaborative Process • **Community-Based Instruction**: Service Learning • **Continuous Progress Assessment** • **Graphic Organizers** • **Problem Solving**: Brainstorming, Debate, Interviews, Questioning, Research •**Technology/Tools:** Computers, Games, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a local author, playwright, or poet to share samples of his/her work.
- Invite a representative of a local agency or company to interpret certain print material (e.g., utility company to explain how to read a bill, county extension agent to explain how to read and interpret nutritional information on food labels, bus company to explain how to read a route schedule).
- Read to special populations in the community (e.g., children in after-school childcare programs, participants in library story hour, individuals in hospitals).

Core Concept: Reading

Sample Elementary Activities

- Create the written text for a wordless picture book. Share your story with younger students. PE
- Respond to a reading selection:
  through group dramatization.
  by changing a main event to create a different ending.
  by producing a commercial or advertisement. PE, OE, P
- Read ads for toys to find specific information (e.g., Does it need batteries? How much does it cost?) OE
- Read books/stories which contain recipes. Write class stories and recipes. PE
- Conduct a "book talk" about a favorite storybook. PE, OE, P
- Develop a rating/ranking system for books you read. OE

Sample Middle School Activities

- Write a response to a book in which you discuss how a character is like someone you know or how a character is like those in other books you have read. P
- Develop a chart to show the attributes you seek in a good book. OE
- Select background music to play while you read a book to a younger child. PE
- Create a graffiti board advertising a favorite book. PE
- Make a collage of propaganda techniques from printed ads. PE
- Gather materials on possible part-time jobs (e.g., baby-sitting, lawn-mowing). Prepare a visual display to illustrate some aspect of the job. PE, P

Sample High School Activities

- Read articles which present two different political or cultural viewpoints. Choose one viewpoint and prepare an argument in support of your choice. OE, P
- Read a story and watch a videotape of the same story. Analyze how each medium impacts the presentation of the story. OE
- Select a story or novel to make into a film. Based on personal characteristics, cast yourself and some classmates into appropriate roles in the film. Analyze how the characters would change if they were from a cultural background different from the one originally cast. PE, OE, P
- Read legal documents (e.g., contracts, wills, deeds); analyze the critical attributes and the implications for future personal use. P
- Read the manuals of similar automobiles made by different manufacturers; make a comparison presentation. PE, OE
- Read books and/or articles on projected societal/economic changes; analyze and predict the future demands of the job market. OE, P

Reflections

Reading is the act of constructing meaning from printed text. It is not a passive act; in fact, it is an intensely interactive process. If students merely word call, they can passively move through the printed page. However, if they read and think about what they're reading—engaging in a read/think, read/think, read/think mode—they not only move through the text, but they construct meaning from it as well. This constructive process inside the mind is called reading.

The suggested activities guide students through a number of structured reading episodes that require explicit individual responses to the reading. Using the sample activities, work with other teachers to develop structured reading experiences that require students to interact with the text, to read with purpose, and to construct meaning from what they read.

Remember, reading is not just a subject students take in school; it is a tool they need in every academic endeavor. If students are to become skillful readers, teachers must structure opportunities in a print-rich environment that cause students to think about the text as they decipher the words.

*Source: Anderson, Hiebert, Scott, Wilkinson, et. al.—*Becoming a Nation of Readers

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.3: Students make sense of the various things they observe.

Learning Links: American Sign Language / Advertisements / Photography / Movement / Patterns / Experiments / Mood / Television / Visual Arts / Relationships / Astronomy / Performances / Body Language

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Draw inferences and defend conclusions based upon a set of observations.
- Compare multiple observations of the same situation.
- Construct meaning from observing nonverbal cues (e.g., gestures, eye contact, touch).
- Connect observations to prior knowledge/experiences.
- Observe for a specific purpose.
- Use all the senses to explore environments (e.g., human, cultural, physical).

Middle School Demonstrators

- Analyze, organize, and interpret information gathered from observations.
- Evaluate multiple observations of the same situation.
- Construct meaning from observing nonverbal cues (e.g., gestures, eye contact, touch).
- Analyze observations using prior knowledge/experiences.

High School Demonstrators

- Formulate and defend ideas by connecting new observations with prior knowledge/experiences.
- Analyze, evaluate, and apply information gathered from observations.
- Construct meaning from observing nonverbal cues (e.g., gestures, eye contact, touch).

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, Reciprocal Teaching • **Community-Based Instruction**: Mentoring, Shadowing • **Continuous Progress Assessment**: Anecdotal Records, Interviews, Observation, Performance Events/Exhibitions, Self-assessment • **Problem Solving**: Interviews, Inquiry, Case Studies, Role Play • **Technology Tools**: Video/Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Shadow a member of the community to observe and record the duties and responsibilities of the job.
- Interview a reporter, magician, meteorologist, inventor, or referee about how observations impact their jobs.
- Attend a professional or school performance.
- Invite a police artist to share how observations are the basis for composite sketches.

Core Concept: Observing

Sample Elementary Activities

- Select a product that is widely advertised in various media. Determine which medium seems most effective in selling this item. Support your conclusion. PE, OE
- Use senses to observe uncooked popcorn kernels; record attributes. Pop the corn and observe again. Record attributes of popped corn. Discuss and draw conclusions about the cause of the physical change. PE, OE
- Select a rock or other object from the school yard. Observe for 5 minutes; describe your rock to a partner. Place all rocks from the class in a closed box. Find your rock. PE
- Observe and record signs of season during an outdoor walk. Classify observations according to senses. PE, P
- Sort a collection of objects (e.g., leaves, lids, keys) by attributes of your choice. Defend your classifications. PE
- Observe a child who has not learned to talk. Gather meaning from the non-verbal signals. PE

Sample Middle School Activities

- Form hypotheses about changes in a nearby community lake over the past two generations. Interview parents and grandparents about the conditions of the lake when they were young. Record and share information. Form class generalizations. Visit the lake and record current conditions. Draw conclusions, compare and test your hypotheses. Construct a model which illustrates the aspects of the lake's changes. P
- Watch a TV debate between political candidates first without sound and then with sound. Using established criteria, determine who is most effective in presenting his/her views in each. OE
- Watch a foreign film. Describe the actions observed and the emotions displayed. PE, OE
- Describe to a person who is visually impaired (non-sighted) the colors of the rainbow, using the other senses. OE
- Observe a non-objective painting. Describe and compare your observations with others in class. PE, OE

Sample High School Activities

- Observe and analyze the lifestyles or habits of healthy and unhealthy individuals. Make predictions about their future health. PE, OE
- Observe the behavior of peers and adults in school and draw inferences about the effects of their behaviors on daily routines. OE, P
- Attend a cultural event. Write a review for publication and illustrate with sketches or photographs. P
- Shadow individuals whose careers interest you. Develop a list of positive work attributes displayed. PE, P
- Observe the behavior of political candidates during a televised debate. Determine the importance of behavior on the electability of the candidate. PE, OE
- Construct a sociogram based on the observations of a group. PE, OE, P

Reflections

The skill of observing is so closely connected to memory that it's almost impossible to separate the two. Learning is retaining information: hooking new information up to past experiences, and eventually using the skill or concept learned in novel ways. To retain, one must remember. To remember, one must first notice, focus, observe, and put that observed information into short or long-term memory.

A basic skill of communication is the ability to observe and accurately report observations either orally or in written form. Students often need practice in developing their observational skills. They must first learn to focus their attention, remember what they see, and find appropriate ways to report the information.

In addition, skilled observers understand the difference between an observation and an inference. Observation is factual; evidence is visible. Inference is implied; meaning is extrapolated and then applied.

To facilitate skillful observations for students, the sample activities suggest an assortment of hands-on experiences. These activities are, of course, only beginnings. Opportunities for students to practice their skills of observing (focusing, remembering, reporting) need to be orchestrated throughout the student's day.

Source: Fogarty & Bellanca—Patterns for Thinking, Patterns for Transfer

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation

1.4: Students make sense of the various messages to which they listen.

Learning Links: Noise / Signals / Telecommunications / Music / Radio/TV / Conversation / Theatre / Animals / Humor / Conscience

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Recognize the purpose and effectiveness of a message.
- Apply a variety of listening strategies (e.g., predict, check, revise, question) for a specific purpose.
- Recognize meaning from verbal cues (e.g., tone of voice, pitch, volume).
- Select and summarize the key points from a message.
- Listen for a specific purpose (e.g., information, entertainment).

Middle School Demonstrators

- Analyze the purpose(s) and effectiveness of a message.
- Interpret a message and support your interpretation.
- Adjust listening strategies for a specific purpose (e.g., information, persuasion, imagination).
- Construct meaning from verbal cues.

High School Demonstrators

- Evaluate messages for a specific purpose.
- Exhibit effective listening strategies for a specific purpose (e.g., information, persuasion, imagination).
- Interpret the impact of verbal cues on a message.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, Reciprocal Teaching • **Community-Based Instruction**: Mentoring • **Continuous Progress Assessment**: Conferencing, Interviews • **Problem Solving**: Brainstorming, Debate, Interviews, Questioning • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Attend a folk-music festival, professional or school concert, opera, or church choir presentation.
- Perform songs, speeches, or sketches for special audiences (e.g., youngsters in childcare programs, senior citizens, songs in sign language for the hearing impaired, or songs in other languages).
- Interview a court stenographer.
- Invite a local biologist, naturalist, or individual knowledgeable about bird calls to class.

Core Concept: Listening

Sample Elementary Activities

- Listen to an instrumental recording then artistically interpret (e.g., draw a picture, create a dance, develop a skit) the emotions experienced. PE
- Create a variety of sound effects to accompany a dramatic presentation. Select and refine the most effective. PE
- Construct a model from oral directions. PE
- Listen to a story and draw an interpretation. PE
- Present a mock trial to a jury. Have jury members explain the reasons for their verdict. PE, OE
- Prepare a sound map of your school, home, or neighborhood. P

Sample Middle School Activities

- Record your voice in different situations and with different people. Analyze your speech and record your interpretations. P
- Choose a nature scene and describe the sounds to a person who is hearing impaired. PE, OE
- Analyze the placement of laugh tracks in a sitcom. PE, P
- Listen to regional dialects; analyze origins and patterns. P
- Choose music to accompany an oral reading of a poem. PE
- Darken the picture on a television and record what information is received. PE, OE
- Create a sound montage using common environmental noises. P

Sample High School Activities

- Prepare a diary of the most important sounds in your life. P
- Listen to songs which make a social statement.
  - Identify social messages delivered through the recordings. OE
  - Create a song with a current social message. PE
- Listen to advertisements; identify persuasive language or music and determine its impact on you, your peers, and on people from different backgrounds. PE, OE
- Record outdoor sounds for 30 minutes; present the information you heard in a creative medium (e.g., hypermedia, video, poem). PE
- Record an aural journal at a specified place and time throughout the year. P
- Create a video drama and accompanying soundtrack. PE, OE

Reflections

To communicate effectively, students must be skilled in reading, writing, speaking, and listening. In human interactions, we are either speaking or listening. Both of these postures are active. Certainly, speaking totally engages the one speaking—but what about listening? Listening, too, must be active and attentive or communication is ineffective.

To structure listening activities that require active, attentive listening, the students should: "Listen and…" evaluate; compare; predict; interpret; web; construct; analyze; determine; describe; present; complete; choose; make; identify. The sample activities suggest a variety of responses.

Rather than just telling students to listen, structure listening activities so students are accountable. Create situations in which students must act on the information after a listening experience. For example, before a concert or film, instruct them to listen for three phrases or scenes; during a talk, have them signal when they hear a targeted phrase. Preparing students ahead of time enables them to use prior knowledge and past experiences to make connections more easily. The more background students have as they approach new material, the more they know what to listen for, and the more likely they are to listen attentively and with purpose.

Source: Bellanca & Fogarty—Blueprints for Thinking in the Cooperative Classroom

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation **1.5 - 1.9:** **Students use mathematical ideas and procedures to communicate, reason, and solve problems.**

Learning Links: Surveys / Matrices / Budget / Marketing / Construction / Interest Schedules /Calculators / Computer Data Displays/ Census / Visual Art / Photography / Architecture / Diagnosis / Legal Proof / Mystery / Evidence

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Draw logical conclusions and explain the thinking processes used in solving problems
- Communicate the meanings of number, space, change, data, and measurement using words, pictures, physical materials, and symbols.
- Select, apply, and justify appropriate mathematical procedures to solve real-life problems using whole numbers and simple fractions.
- Listen to, read about, write about, and speak about mathematical ideas and procedures.

Middle School Demonstrators

- Use deductive and inductive reasoning to synthesize information related to problems, making conjectures, exploring, validating, and convincing others.
- Communicate the meanings of number, space, change, data, and measurement verbally, pictorially, symbolically, and concretely.
- Model problem solving situations using oral, written, concrete, pictorial, graphic, and simple algebraic methods.
- Select, apply, and justify appropriate mathematical procedures to solve real-life problems using rational numbers.

High School Demonstrators

- Use deductive and inductive reasoning to synthesize information related to problems, developing facility with mathematical language and notation.
- Communicate the meanings of number, space, change, data, and measurement, formulating mathematical definitions and generalizations and utilizing technology.
- Select, apply, and justify appropriate mathematical procedures to solve real-life problems using real numbers.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Service Learning • **Continuous Progress Assessment**: Performance Events, Portfolio Development, Interviews • **Problem Solving**: Inquiry, Brainstorming, Research, Debate, Creative Problem Solving, Future Problem Solving • **Technology/Tools**: Computers, Calculators, Manipulatives, Games

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Use Census Department data to investigate population trends.
- Invite local quilters to class to show examples of repeated patterns (tessellations) in quilts.
- Collect information from local insurance agents to compare rates for various cars and drivers.
- Visit local landscaping operation or botanical garden and design a landscape project for the community using native plants (e.g., on school grounds, city park, vacant lot, or homeless shelter). Contact agencies for technical assistance.
- Organize service projects that use measurement skills (e.g. assist in Habitat for Humanity home building, monitor local water quality, build picnic tables).

Core Concept: Mathematical Communication and Reasoning

Sample Elementary Activities

- Design a quilt or T-shirt using geometric patterns. Explore the use of geometric patterns in art from a variety of cultures. PE, P
- Solve several different types of problems in which each team member uses a different method of computing (e.g., using a calculator, paper and pencil, mental math). Discuss which way of solving the problem is more efficient and why. OE
- Brainstorm patterns that can be identified in the environment, the home, a classroom, a closet, the zoo, a garden, a fruit and/or a fabric store. OE
- Group and sort buttons in a button box into sets based on type, color, size, number of holes, and shape. PE

Sample Middle School Activities

- Develop a set of directions for assembling a model that includes drawing and text. PE, OE, P
- Investigate Pascal's triangle to discover number patterns. Use these number patterns to aid problem solving. OE
- Determine if the local environment is being harmed by a certain behavior (e.g., littering, pollution). Analyze how the behavior, if continued, will affect the environment in the future and predict what actions could alter this trend. P
- Select an argument (e.g., changing tax structure, local bond issue) raised by a political candidate and determine the accuracy of the argument. OE, P
- Invent a ' function machine." Display the results using computer graphics. PE, OE.

Sample High School Activities

- Design an investigation to determine the amount of food being thrown away from the school cafeteria. Organize and analyze the data. Survey the student body for menu alternatives. Propose a menu based on the survey. Implement and repeat the study to evaluate the new menu. Use spreadsheets, word processing, and computer graphics to collect, manipulate, and present the findings. PE, OE, P
- Select stocks and create a database from tracking highs, lows, increases, decreases, and trends. PE, P
- Design an advertisement layout according to determined criteria for a product or location. PE, P
- Design a better container for a product and present an argument to convince the manufacturer to use the new container. PE, P
- Compute and graph fixed and variable interest rates on a home loan using appropriate computer software. Evaluate the graph to determine the best selection for a specified situation. Defend your choice. PE, P

Reflections

Communication in the mathematics classroom entails "fundamental issues about knowledge: What makes something true or reasonable in mathematics? How can we figure out whether or not something makes sense? That something is true because the teacher of the book says so is the basis for much traditional classroom discourse. Another view, the one put forth here, centers on mathematical reasoning and evidence as the basis for the discourse. In order for students to develop the ability to formulate problems, to explore, conjecture, and reason logically, to evaluate whether something makes sense, classroom discourse must be founded on mathematical evidence. Writing is another important component of the discourse. Students learn to use, in a meaningful context, the tools of mathematical discourse - special terms, diagrams, graphs, sketches, analogies, and physical models, as well as symbols."

Source: National Council of Teachers of Mathematics - Professional Standards for Teaching Mathematics

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.10: Students organize information through development and use of classification rules and systems.

Learning Links: Flow Charts / Catalogues / Animal Kingdom / Yellow Pages / Inventories / Caste System / Schedules / Taxonomies / Genetics / Computer Programming / Census

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Elementary Demonstrators

- Develop and communicate a classification system based on a minimum of two criteria to show information and/or ideas.
- Apply a classification system based on a minimum of two criteria to organize objects, information, or ideas.
- Identify and analyze relationships among objects, information, or ideas.
- Investigate classification systems using real objects.
- Investigate relationships among real objects.

Middle School Demonstrators

- Develop a classification system based upon multiple criteria to show relationships among objects, information, and ideas.
- Apply a classification system based upon multiple criteria to organize objects, information, and/or ideas.

High School Demonstrators

- Develop a complex classification system to show relationships among objects, information, and/or ideas.
- Apply a complex classification system to organize objects, information, and/or ideas.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Networking • **Continuous Progress Assessment**: Anecdotal Records • **Graphic Organizers**: Compare/Contrast Structures, Venn Diagrams • **Problem Solving**: Brainstorming, Formulating Models, Interviews • **Technology/Tools**: Manipulatives, Computers, Telecommunications

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit the public library to observe how materials are classified.
- Interview various organizations in the community and classify them according to services provided.
- Invite a museum curator to discuss classification procedures.
- Use Audubon Society and bird watching surveys to investigate classification schemes.

Core Concept: Classifying

Sample Elementary Activities

- Determine a classification scheme for art reproductions, using two or more sorting criteria. PE, OE
- Sort a collection of small objects and give a rationale. Use the collection to make collages. PE
- Collect and display information about crops grown on a farm. PE, P
- Compare similar foods for the specific nutritional content of fats, sugar, sodium, etc. Develop a week-long nutritional menu based on your findings. P
- Compare species of trees in an urban environment with those in rural areas. Network through telecommunications to collect data and display using computer graphics. P

Sample Middle School Activities

- Develop different schemes for classifying baseball cards and use statistics to determine, by position, a "dream team" for a Nintendo game. P
- Sort plants by type and growing condition. Design and plant a garden based on information. PE, OE
- Invent and apply classification systems that show common characteristics found in some classmates (e.g., favorite color, food, story, poem). PE, OE, P
- Compare classification criteria in determining the ranking of cities in Kentucky to other metropolitan areas across the United States (e.g., lowest in violent crimes, highest in new jobs). PE, OE, P

Sample High School Activities

- Create a flowchart to classify polygons. PE
- Conduct a community survey (e.g., environmental problems, social needs, cultural needs, health concerns) and organize results. P
- Create a filing system for an office. Implement and make necessary adjustments. PE
- Analyze demographic information of the local population to determine marketing techniques. Analyze how marketing techniques vary based on the cultural make-up of the target audience. Present to advertising decision-makers. PE, OE, P

Reflections

Paralleling the skill of accessing information is the complementary skill of organizing that information. To make sense of the data gathered, systematic sorting and classifying of information are essential. In the process of sorting items into labeled categories, patterns emerge. The brain seeks order and patterns, so when students are able to organize input they are better able to connect it to prior knowledge and construct meaningful connections.

When there is a lot of information, data must be organized into manageable units. To create those units, a classification system must be devised and used.

From closets and sock drawers to the animal kingdom or the library, the opportunities to sort, categorize, label, and classify abound. Classification is evident everywhere, from yellow pages, zip codes, and area codes, to social security numbers, and airline fares.

The sample activities provide a starting point for other extended activities in classifying.

Sources: Fogarty & Bellanca—Patterns for Thinking, Patterns for Transfer
Beyer—Practical Strategies for the Teaching of Thinking

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.11: Students write using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.

Learning Links: Video/Film Scripts / Journals / Advertisements / Notation / Speeches / Letters / Manuals / Reports / Literature / Newspapers / Songs

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators	*Middle School Demonstrators*	*High School Demonstrators*
Establish and use criteria for effective writing to evaluate own and others' writing.	Establish and use criteria for effective writing to evaluate own and others' writing.	Establish and use criteria for effective writing to evaluate own and others' writing.
Use writing as a learning tool.	Refine writing as a learning tool.	Internalize writing as a learning tool.
Write for a variety of purposes (e.g., expressive, transactive, imaginative) and forms (e.g., journal entry, letter, poem/story) to a variety of audiences.	Write for a variety of purposes (e.g., expressive, transactive, imaginative) and forms (e.g., journal entry, letter, poem/story) to a variety of audiences.	Write for a variety of purposes (e.g., expressive, transactive, imaginative) and forms (e.g., journal entry, letter, poem/story) to a variety of audiences.
Use a process approach to writing.	Practice a process approach to writing.	Internalize the use of a process approach to writing.
Exhibit fluency.	Exhibit fluency and organization.	Exhibit fluency, organization, and correctness.
Generate ideas that stimulate language expression (e.g., brainstorming, free writing, storytelling, reading).	Enhance ideas that stimulate language expression and form (e.g., cluster, discuss, question, read).	Expand and refine ideas that stimulate language, expression, and form.
Express thoughts/ideas through verbal and/or symbolic representation (e.g., pictures, scribbles, words).		

Sample Teaching/Assessment Strategies:

Collaborative Process: Peer Tutoring • **Continuous Progress Assessment**: Anecdotal Records, Checklist, Conferencing, Interviews, Observation, Portfolio Development, Self-Assessment, Performance Events/Exhibitions • **Graphic Organizers** • **Problem Solving**: Brainstorming, Questioning, Debate, Interviews, Research • **Technology/Tools**: Computers, Multimedia, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a writer from the local paper to discuss how different purposes (e.g., news reporting, editorials) are used.
- Interview a local author to discuss how ideas are developed.
- Visit an advertising firm to discover how words are used as tools.

Core Concept: Writing

Sample Elementary Activities

- Write new lyrics for familiar songs. PE
- Create a class joke book. PE
- Create greeting cards for a variety of occasions. Organize a campaign to market your product. PE
- Use telecommunications to establish a project partnership with a school in another geographic location. PE, OE
- Explore the use of writing in real life by interviewing people from different occupations. Chart the types of writing used. PE, P
- Write a letter to a business praising a product or service. OE, P
- Keep a log of ideas and understandings about a content topic. OE, P

Sample Middle School Activities

- Write an information guide for next year's class of students. PE, OE
- Write a fairy tale from a different point of view and share with a younger audience. PE, OE
- Research a planet. Create a life form. Interview the "creature" about life on the planet and write a news article on the visitor. OE
- Identify and study a school or community problem. Design a plan of action with multiple solutions. Present the plan to the appropriate audience. PE, OE
- Compose a letter to a family member persuading him/her to change an unhealthy habit or lifestyle. OE, P
- Write a script for a commercial. OE

Sample High School Activities

- Create an informative portfolio representing yourself. P
- Write a song (e.g., rap, opera, rock, country) about one of your teachers. OE
- Prepare a resume and letter of application for an actual job advertisement. OE
- Write a handbook, survival manual, or books of tips for high school students to sell to middle school students. PE, OE
- Construct an operations manual for a piece of equipment (e.g., lawn mower, blender, wheel chair). OE
- Write slogans to encourage classmates to follow school safety rules. PE, OE

Reflections

The written word is one of the most powerful tools available for communicating thoughts, ideas, and feelings. Students will always be asked to respond, create, or inform in writing as a means of communicating with others. The ability to write for a variety of audiences, to organize and focus writing, and to communicate successfully is an absolute necessity in the age of communication.

Additionally, writing is a powerful thinking tool when used as "thinking to be read." It requires students to analyze, synthesize, reflect, and use other thinking skills. The "writing to learn" strategy also involves multiple forms, purposes, voices, and audiences. Writing used frequently, and for a variety of purposes, also enhances the student's abilities to read, listen, and speak.

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.12: Students speak using appropriate forms, conventions, and styles to communicate ideas and information to different audiences for different purposes.

Learning Links: Translation / Storytelling / Telecommunications / Acting / Politics / Teaching / Conversation / Legal Argument / Interview / Selling / Bargaining / Diplomacy / Mediation

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Recognize the need to adjust communication based on audience response.
- Practice formal presentation for a specific audience and purpose (e.g., report, choral reading).
- Practice appropriate verbal (e.g., volume) and nonverbal (e.g., eye contact, facial expression, posture) behaviors.
- Engage in informal communications (e.g., conversation, social greetings/ introduction, expression of thoughts/ feelings).

Middle School Demonstrators

- Analyze communication for audience response.
- Refine formal presentations for a variety of audiences and purposes (e.g., entertainment, imagination, information, persuasion).
- Use effective verbal (e.g., voice variety, rate, pitch) and nonverbal (e.g., gestures, movement) behaviors.
- Refine informal communications (e.g., conversation, discussion, interviews, expressions of thoughts/feelings).

High School Demonstrators

- Evaluate and adjust communication for audience response.
- Deliver formal presentations for a variety of purposes (e.g., entertainment, imagination, information, persuasion).
- Exhibit effective behaviors for a variety of informal communications.
- Use effective verbal and nonverbal behavior to enhance presentation.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, Reciprocal Teaching • **Community-Based Instruction**: Service Learning, Mentoring, Networking • **Continuous Progress Assessment**: Interviews, Conferencing, Performance Events/Exhibitions • **Graphic Organizers**: Advance Organizers, Notetaking • **Problem Solving**: Debate, Interviews, Oral History, Role-play • **Whole Language Approach**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Make an oral presentation to members of a local board or council (e.g., school board, fiscal court, neighborhood association, city council) about an issue of concern.
- Become "phone-pals" with area residents (e.g., elderly citizens living alone, individuals with disabilities, home-bound students).
- Invite a local actor/actress to discuss the verbal and nonverbal changes with different types of plays.

Core Concept: Speaking

Sample Elementary Activities

- Share a family heirloom or tradition of special significance. PE
- Give oral directions to classmates on "how-to" accomplish a task (e.g., make a sandwich, make a bed). After the class has followed your directions, evaluate your communication. PE, OE, P
- Describe a favorite outfit or toy, so that a classmate is able to draw it. PE, OE
- Create a performance (e.g., choral reading, flannel story, puppet show) for a younger audience. PE
- Make a presentation to introduce your parent/guardian at open house. PE

Sample Middle School Activities

- Dress as a main character from a novel. Share information about your character (e.g., experiences, problems, friends, family, concerns, hopes). PE, OE, P
- Conduct and tape an interview. Review the tape and evaluate your strengths and weaknesses as an interviewer. PE, P
- Prepare tapes of books to share with an audience (e.g., younger students, nursing home residents, hospital patients). PE
- Produce and present a school communication program (e.g., news program, assembly, intercom announcement). PE, OE
- Present an illustrated speech to elementary students about the different opportunities in middle school (e.g., exploratory, intramurals, teaming). PE, OE, P

Sample High School Activities

- Keep an electronic portfolio of your formal speaking activities. Reflect on your strengths and weaknesses and on progress demonstrated over time. OE, P
- Prepare and present your qualifications for a particular position. PE, P
- Teach a group of peers the American Sign Language alphabet. PE
- Make a presentation to eighth graders on high school clubs. PE, OE
- Video a public service announcement supporting an issue (e.g., education reform, recycling, safety). PE

Reflections

The primary productive language skill is speaking. Young children mimic the language of others and in the process learn to use language with ease. To create this same natural flow of language in more formal settings, and in order to communicate ideas through oral language, students need frequent and structured opportunities to speak.

Beginning with formal, impromptu experiences such as storytelling, sharing, and role-playing and then moving to written material such as speeches, debates, or plays, students develop confidence in their use of oral language. This ability to present oneself and one's ideas in skillful and effective ways is an important goal of oral communication.

It is interesting to note that public speaking creates anxiety in many adults. People hate to get up and present their ideas in front of their peers. Teachers can reduce this anxiety in students by providing rich and diverse opportunities for students to hone their abilities and develop the skills necessary for effective, confident oral communication. Those skills include developing an organizational plan, researching background information, and delivering an idea effectively. The suggested activities offer many learning situations that enable students to develop oral communication skills.

Source: Fogarty & Bellanca—Blueprints for Thinking in the Cooperative Classroom and Patterns for Thinking, Patterns for Transfer

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation **1.13:** Students make sense of ideas and communicate ideas with the visual arts.

Learning Links: Environmental Design / Graphic Design / Fiber Art / Interior Design / Crafts / CAD / Set Design / Television / Aesthetics / Fashion / Landscaping / Photography / Film/Video / Museums / Jewelry / Light

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Express an idea, image, or pattern utilizing elements and principles of design.
- Examine and construct meaning from visual art and architecture.
- Explore elements (space, line, shape/form, value, texture, color) and principles (balance, emphasis, contrast, variety, repetition, movement, rhythm, pattern, proportion/distortion, transition/graduation, dominance/subordination, harmony, unity) of design in visual works.
- Use drawing, painting, print making, modelings, and constructing to communicate ideas and feelings.
- Use art media, tools, techniques, and processes.

Middle School Demonstrators

- Create a visual product which illustrates and integrates ideas and feelings.
- Compare and analyze various visual art forms.
- Describe the elements and principles of design used to communicate ideas and feelings.
- Use drawings, painting, printmaking, sculpting, ceramics, fibers and technology to communicate attitudes, ideas, and feelings in a wide variety of media.
- Use art media, tools, techniques, and processes skillfully.

High School Demonstrators

- Integrate the elements and principles of design with varied visual media to communicate ideas.
- Interpret and critique visual art and architecture.
- Use a wide variety of traditional, technical, and innovative art processes and media to communicate ideas, attitudes, and feelings.
- Determine and use appropriate tools, media, processes, and techniques skillfully and with attention to good craftsmanship.

Sample Teaching/Assessment Strategies:

Continuous Progress Assessment: Portfolio Development • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Formulating Models, Creative Problem Solving, Role-play • **Technology/Tools**: Manipulatives, Puppets, Multimedia • **Whole Language Approach**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit art exhibits, galleries, museums, crafts stores, historic buildings and sites.
- Invite local crafts person, artisan, or professional (e.g., potter, stained glass artist, painter, sculptor, woodworker, planner, architect or designer) to class or visit their workplace.
- Use community buildings and spaces for the exhibition of art work.
- Interview local store owners on how the display of merchandise impacts the sale.

Core Concept: Visual Arts

Sample Elementary Activities

- Create an animal sculpture with movable parts. PE, P
- Manipulate shapes of different sizes, color, and balance to construct a building, bridge, etc. PE, P
- Produce a crayon batik quilt. PE, P
- Research pottery of diverse cultures; select a style and recreate similar designs. PE, P
- Produce a fabric design to be used as a performing costume. PE
- Make book character sculptures. PE
- Draw a person, flower, or tree from life. PE
- Use drawing and painting to illustrate a poem or story. PE, P

Sample Middle School Activities

- Build a replica of a ship, plane, car, or building. Define artistic elements and principles of design used in the creation process. PE, P
- Collect logo and flag samples and research design rationale. Develop a team logo and flag. PE, P
- Weave a basket from natural fibers. PE, P
- Paint a back drop for a school musical or play. PE
- Use a hand construction technique to make a functional clay vessel; decorate and fire. PE
- Analyze an art object or a piece of architecture and explain how the artist/architect used design elements or principles to express an idea or feeling. PE, OE
- Redesign your classroom to reflect a period, theme, or culture being studied. PE, OE, P

Sample High School Activities

- Design a home for you and your family. Use floor plan scale drawings to explain interior space and elevation for exterior space. PE, P
- Design a statue, monument, or piece of art for a specific public space. Explain choice of media, imagery, and location. PE, P
- Create costumes and set design for an elementary or middle school performance. PE, P
- Paint an expressive self-portrait. PE
- Use a computer to illustrate language arts, math, or science projects. PE, P
- Visit an historic site. Create visuals for a brochure using photographs, line drawings, and selected type. P
- Research and report on the Kentucky clay deposits. Use natural clays to make a utilitarian vessel. PE, OE, P
- Film special events and daily school life and edit into a video documentary or year book. PE, P

Reflections

The visual/spatial intelligences, as delineated by Gardner's work in multiple intelligences, is a valued way of knowing and expressing how one perceives the world. The visual arts permit expressions that transcend the boundaries of the verbal/linguistic modality. Through drawings, paintings, printmaking, sculpting, ceramics, fibers, and technology, students have powerful communication tools at their command.

This particular academic expectation, constructing meaning and/or communicating ideas through the visual arts, is also aligned with the models of integrated curricula. Use of the visual arts presents opportunities to share ideas with others in universally understood media. Symbolic language, design, and graphic representations of ideas are threads that weave through every discipline and every culture. In addition, the visual arts, when coupled with verbalization skills, present the perfect balance for communication arts such as film and video production.

Schooling students in the visual arts develops their spatial intelligence and gives them other channels for learning, knowing, producing, and sharing.

Sources: Gardner—Frames of Mind
Lazear—Seven Ways of Knowing
Campbell, Campbell, & Dickinson—Teaching and Learning Through the Multiple Intelligences

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.14: Students make sense of ideas and communicate ideas with music.

Learning Links: Sound Tracks / Lyrics / Opera/Musical / Hymns and Chants / Body Percussion / Band/Orchestra / Dance / Composition / Folk Songs / Symmetry / National Anthems / Synthesizer / Chorus

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Communicate ideas and emotions through performing and/or creating music using developmentally appropriate performance techniques/practices and music concepts.
- Recognize and develop music concepts (melody, harmony, rhythm, form, expression, and style).
- Experience and perform music from diverse cultures.
- Choose, perform, and listen to music for personal enrichment.
- Explore and respond to music through singing, instrument playing, moving, listening, reading, writing, and creating.

Middle School Demonstrators

- Communicate ideas and emotions through performance and/or composition using developmentally appropriate performance techniques/ practices and music concepts.
- Recognize and demonstrate music concepts using appropriate terminology.
- Compare and contrast music of diverse cultures.
- Choose, perform, and listen to music for personal enrichment.
- Experience and respond to music through singing, instrument playing, moving, listening, reading, writing, and creating.

High School Demonstrators

- Create and/or communicate ideas and emotions through performance and/or composition using developmentally appropriate performance techniques/practices and music concepts.
- Evaluate the conceptual structure and performance techniques used to communicate ideas and emotions.
- Analyze the similarities and differences in music among diverse cultures.
- Choose, perform, listen to, and analyze music for personal enrichment.
- Experience music and develop appropriate performance skills through singing and instrument playing.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Performance Events/Exhibitions • **Technology/Tools**: Computers, Games, Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Experience community music performances (e.g., churches, radio stations, recording studios, cable, public access, dance groups).
- Invite local musicians (e.g., classical, jazz, folk, rock) and instrument builders to class.
- Participate in local music festival or production.

Core Concept: Music

Sample Elementary Activities

- Compare and contrast music performed from different cultures (e.g., Latin America, Africa, Asia) and North American music forms (e.g., folk, country, bluegrass, jazz, pop) and how performing practices are alike and different. OE
- Choose a music selection and create an accompanying visual art work, choreography, or dance. PE, P
- Create and conduct a survey of classmates' personal music preferences and perform a skit representing the top three preferences. PE, P
- Create a musical instrument and demonstrate how the instrument should be played. Use music vocabulary in the presentation. PE, P
- Perform varied music genres in the appropriate music style using developmentally appropriate music skills. PE, OE, P

Sample Middle School Activities

- Analyze the music of a historical period and show how it reflected the social, economic, and political conditions of the period. OE
- Use different forms of music in a presentation to communicate the moods and ideas of adolescence. PE, P
- Analyze the use of music for religious and social purposes in various regions of the world. OE, P
- Make a music video of a science, social studies, or math theme being studied. Define life-like music roles used in the production. P
- Perform varied music genres in the appropriate music style using developmentally appropriate music skills and playing techniques. PE, OE, P

Sample High School Activities

- Create a media presentation set to music representing the emotions and critical attributes of an event having social, political, cultural, and historical impact. Define life-like music roles used in production. P
- Analyze the background music of movies and television shows and communicate the emotions and feelings involved. OE, P
- Create and perform music for in-school ceremonies. PE, P
- Create and perform humorous musical productions to enhance learning. P
- Perform varied music genres in the appropriate music style using developmentally appropriate music skills and playing techniques. PE, OE, P

Reflections

Like the visual arts, music is a universal language that crosses curricula and cultures. Think about the friends or students you know who hear a song once and know it, hear a melody and play it back, listen to the meter in poetry and reproduce that meter in a personal poem. These people, adept in the musical intelligence, illustrate a learning avenue that offers other ways of teaching and learning.

By incorporating singing, instrument playing, listening, notation, and composition into academically focused learning experiences, students develop their own musical skill and intelligence. They are then equipped to use that skill and talent in expressing their own knowledge and creative ideas. Of course, the power of this mode of communication is in the dual responses that the musical intelligence evokes—both the affective and the cognitive. All learning is enhanced when the emotions are tapped; if one is intensely involved in learning, that learning is slotted into long-term memory more easily. By taking advantage of the power of music, by using this motivating messenger, students have yet another viable way to communicate their ideas and emotions.

Sources: Gardner—Frames of Mind
Lazear—Seven Ways of Knowing
Campbell, Campbell, & Dickinson—Teaching and Learning Through the Multiple Intelligences

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation 1.15: Students make sense of and communicate ideas with movement.

Learning Links: Sports / Effort / Body Language / Coordination / Transportation / Dance / Mime / Migration / Improvisation / Patterns / Waves / Gravity / Dynamics / Trajectory

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Create a movement sequence with a beginning, middle, and end.
- Analyze ideas or emotions expressed through a movement sequence using basic terms.
- Demonstrate combined locomotor and nonlocomotor movement patterns.
- Express ideas/emotions through movement (e.g., body awareness, space awareness, time, force, technique, relationship).
- Demonstrate movement elements (e.g., locomotor and nonlocomotor).

Middle School Demonstrators

- Create a complex movement sequence with a beginning, middle, and end.
- Analyze a movement sequence using appropriate terminology.
- Demonstrate combined movement sequences that express an idea or emotion.

High School Demonstrators

- Create and evaluate a dance performance using appropriate technical, performance, and thematic elements.
- Choreograph a movement sequence that expresses ideas or emotions.
- Analyze the similarities and differences in a variety of dance forms (e.g., ballet, modern, jazz, ethnic, folk, social, and square) among diverse cultures.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies • **Continuous Progress Assessment**: Performance Events/Exhibitions • **Graphic Organizers**: Storyboard, Graphic Representations • **Problem Solving**: Creative Problem Solving, Role-play • **Technology/Tools**: Interactive Video, Games

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Attend community theatre, dance studios, clogging, and square dance performances.
- Interview sports participants about their use of movement.
- Discuss movement patterns with transportation planners, engineers, soil conversation planners, movers, and real estate agents.

Core Concept: Movement

Sample Elementary Activities

- Express emotions non-verbally through body language and facial expression (mime). Other students verbally express how they think you feel. OE, P
- Using clay, construct a sculpture of a person engaged in dance or gymnastic activity, making sure figure is balanced. PE, P
- Interpret a work of art through movement. PE, P
- Select and read an account of a sporting event. Create a movement sequence that portrays the event. P
- Describe the growth of a plant, the blooming of its flower, and seed dispersal through a movement sequence. PE, OE, P

Sample Middle School Activities

- Pantomime a movement sequence to express your feelings about an event. PE, OE
- Play charades using historical events as your themes. PE
- Observe the non-verbal behaviors of a small group in the cafeteria. Create a dialogue based on your observations. PE, OE
- View a dance performance that tells a story. Express your interpretation of the story in another media and from another culture. P
- Write a paragraph expressing a personal conflict with another person. Dramatize the conflict. PE, OE, P

Sample High School Activities

- Illustrate the concept of the four levels of protein organization through team/body movements with each team member representing one amino acid. PE, P
- Review the works of a single visual artist and interpret the artist's style through movement. PE, OE, P
- Pantomime to a concert singly or in a group. After identification of the concept, analyze and critique the pantomime in terms of the completeness and accuracy of the representation. PE, P
- Create a machine sculpture using student bodies and body movement. PE

Reflections

As described by Gardner, the kinesthetic intelligence is the intelligence seen in the skill and grace of athletes, dancers, actors and jugglers. The development of precision and skill in movement is critical because we rely on motor skills throughout life.

In the early years of school, movement is considered an integral part of the many experimental activities through which children learn. Students need to continue developing and refining motor skills to enhance coordination, refine ease in movement, and reinforce physical fitness. For this reason, movement can and should be integrated into the standard curriculum.

According to Gardner, many students learn, and demonstrate learning best through the kinesthetic intelligence. To experience long-term learning, they need more opportunities to express themselves through movement. For example, the suggested activities that target non-verbal communication such as movement sequences, body language and sports-related skills, can be targeted as learning activities within traditionally structured lessons. In this way, opportunities for movement become tools for learning throughout the student's day.

Sources: Gardner—Frames of Mind
Lazear—Seven Ways of Knowing
Campbell, Campbell, & Dickinson—Teaching and Learning Through the Multiple Intelligences

Goal 1: Use Basic Communication and Mathematics Skills

Academic Expectation

1.16: **Students use computers and other kinds of technology to collect, organize, and communicate information and ideas.**

Learning Links: Fiberoptics / Modems / Distance Learning / Microwave Transmission / Satellites / FAX Machines / Remote Sensing / CAD/CAM / Robotics / Bulletin Boards / E-Mail

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Elementary Demonstrators

- Express information and ideas using technology.
- Gather and manipulate data using technology.
- Use technology to display information in various ways.
- Use a variety of technologies in various ways.

Middle School Demonstrators

- Compare and analyze the effectiveness of various technologies for a specific purpose.
- Expand knowledge by identifying and using technology for a specific purpose.
- Integrate the use of a variety of technologies.
- Analyze relationships/patterns to draw inferences using technology.
- Express information and ideas creatively using technology.

High School Demonstrators

- Analyze and select appropriate technologies to efficiently complete a task and/or enhance productivity.
- Conduct investigations; solve problems; create products; complete tasks by integrating various forms of technologies.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Continuous Progress Assessment**: Portfolio Development • **Graphic Organizers**: Time Line, Graphic Representations • **Problem Solving**: Creative Problem Solving, Inquiry, Future Problem Solving, Research, Case Studies, Simulations • **Technology/Tools**: Computers, Calculators, Telecommunications, Distance Learning, Interactive Video, Multimedia, Videotaping • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Interview a representative from KET on the ways technology influences programming.
- Invite a local doctor to discuss how technology influences diagnosis and treatment.
- Interview a representative from a newspaper on technological changes in the industry.

Core Concept: Using Electronic Technology

Sample Elementary Activities

- Create a database to record information about different trees. Recommend whether a given tree would flourish in Kentucky based on understanding of climate and weather in the state. PE
- Use a spreadsheet to record and graph the growth of plants given different soil and atmospheric conditions. Using a multimedia platform, present your findings as to the best methods to promote or hinder plant growth. P
- Use CD-ROM reference materials to gather information to produce a report using multimedia (e.g., a word processor with graphing capabilities) comparing the metamorphosis of caterpillars to moths and tadpoles to frogs. P
- Use audio or video tape to collect an oral history of your community. Write a report using multimedia to compare the variations in story versions. OE, P
- Use hypermedia to present the sequence of events in the growth of a flower from a seed. P

Sample Middle School Activities

- Compare the damage created by earthquakes and volcanoes in the 20th century in the United States using a spreadsheet and graphing program. Use multimedia to report the results in a narrative document. P
- Compare the personal characteristics of heroes from literature using a database. Present the results as posters created with graphic software. PE
- Demonstrate the movement of the planets in our solar system using hypermedia. PE
- Demonstrate how to proportionally increase ingredients in various recipes using a spreadsheet. PE
- Share autobiographies with students from another district using an electronic bulletin board via telecommunications. PE, P

Sample High School Activities

- Record and analyze, in a database, information related to capital punishment. Write a position paper, using research from CD-ROM and telecommunications resources, which either supports or refutes capital punishment as a means of crime prevention. P
- Demonstrate the effects of changing variables in algebraic equations using a spreadsheet and graphs. PE
- Demonstrate, using hypermedia, the differences in energy use between monocotyledons and dicotyledons. P
- Discuss political issues with other students who are of a different political party or cultural background (e. g., Republican, Democrat, Independent, etc.) using telecommunications. Enter commentaries from discussions in a reflective journal. P
- Present the economic, social, political, and entertainment issues related to the Kentucky Derby using multimedia. Reflect an opinion in the presentation as to the effects of these factors. P
- Gather and analyze information regarding lotteries across the United States, using CD-ROM reference material and a spreadsheet with graphing capability. Prepare a position paper, using a word processor, about the value of lotteries with regard to the number of dollars spent by consumers, dollars won by consumers, dollars spent on advertising, and operational costs and the amount used for other purposes (e. g., funding state initiatives or special projects). P

Reflections

Students live in a high-tech world where computer hardware and software change almost daily, where satellite communications, facsimile machines, modems, fiber optics, and microwave transmission permit instantaneous interactions across boundaries and oceans. It is imperative, therefore, that they engage in electronic investigation and exploration. Students must be familiar not only with word processing program, and databases, but also spreadsheets, graphics, telecommunication, and multi-media software. In addition, they must be able to utilize these technologies to create new information and resources.

Students equipped with the primary skills of electronic technology are able to gather, organize, manipulate, and express data and ideas. They are also skilled enough to create information and resources, and to continue the development of future technologies.

In an information society, where the doubling of known information is measured in months, only through technology can students hope to keep abreast of cutting-edge ideas. Many students already have the ability to deal with the technical world ("If you have a computer problem ask a kid!"). Do whatever possible to foster and encourage the natural inclination of these young electronic wizards.

Source: Fogarty & Haack—Future World, Future School

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Transformations:

Goal 2

Apply Core Concepts and Principles

Language Arts

Language Arts

What Is The Purpose Of Language Arts?

The ability to communicate impacts a person's achievement in all academic areas of school and throughout life beyond school. As individuals read, write, speak, listen, and observe, the ability to communicate grows increasingly more sophisticated and refined. Language arts instruction guides students in becoming literate citizens, capable of reasoning and problem solving.

Learning and communication are not linear processes.

A Learning Spiral

The language arts program may be seen as a spiral through which students at every age practice similar experiences with increasing sophistication and maturity. Process components are introduced at the appropriate developmental level and then are reinforced, strengthened, and refined. Thus, language is learned through frequent practice, making active involvement an essential component of learning.

This spiraling process represents language acquisition as complex and developmental. These capacities are acquired at different rates, in different ways, and by building on prior knowledge.

In Mr. Lewis's primary class, a group of students have just listened to "The Gingerbread Man." As they talk about the story, they decide they would like to bake their own gingerbread people. . .

During reading workshop in Ms. Edward's 8th grade class, Jean chose a new book and started to read. She can hardly wait to talk with her best friend and share what she has read. . .

Ms. Brown's juniors have just read in the newspaper that graduation requirements may change. They generate a list of their own recommendations and compare them to the actual proposal. Strong opinions abound and they want to be involved. Plans include speaking at the public hearings, writing letters. . .

Listening, speaking, reading, and writing are occurring in all three classrooms. The age levels are different; the materials are different; the teaching strategies are different. The academic expectations are the same -- the use of language for real, worthwhile purposes.

A Learning Whole

Reading, writing, speaking, listening, and observing are not separate subject offerings. They are parts of an interdependent whole. Instruction must mirror reality and make connections among these highly interrelated processes. Language development should occur in rich, real-world contexts with multiple opportunities to explore, understand, and share.

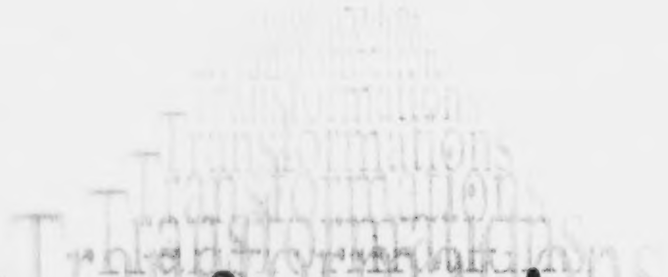
A Learning Standard

The International Reading Association, the National Council of Teachers of English, and the Center for the Study of Reading have united efforts to develop national standards for reading, language arts, and English in the United States. These standards will guide teachers as they help students develop literacy, language abilities, critical thinking skills, and creative problem-solving strategies. Scheduled for completion in 1995, the standards will include a framework for teaching and learning with vignettes of classroom practice.

A Learning Tool

Communication is a tool for learning and demonstrating knowledge across the curriculum. It is critical that the academic expectations traditionally associated with language arts programs be part of all disciplines. The academic expectations for language arts–reading, listening, observing, writing, and speaking–are included in Learning Goal 1 to emphasize the application of communication skills in situations similar to real life.

> *Only through learning to speak, listen, read, and write imaginatively and skillfully can any of us achieve personal fulfillment and the literacy necessary to participate . . . in a democratic society.*
>
> **Janet Emig, Chair**
> **Standards Project for English Language Arts**



Transformations:

Goal 2

Apply Core Concepts and Principles

Science

Science

> *Science is built of facts, just as a house is built of bricks,*
> *but a collection of facts cannot be called a science*
> *any more than a pile of bricks can be called a house.*
>
> **Henri Poincare**

Science is a way of knowing. It is a way of solving problems. It is a way of organizing information, seeing relationships, understanding how things work, keeping a proper perpective, recognizing the consistency of the universe, and observing change.

The challenge is not to specify content used to address the academic expectations, but rather to determine a different way of looking at this content. There is no lack of topics to be used in science classes. There is, however, a new responsibility for teachers of science to reorganize their instruction.

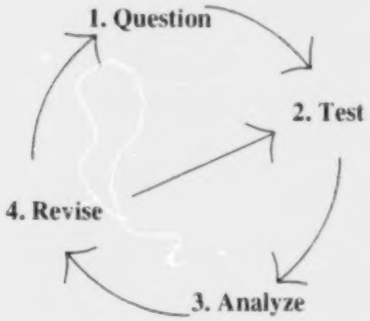
In the past, emphasis has been on the "What" rather than the "How"—content rather than process. Teaching the "What" of science is important, but students need to use the "How" as well. There must be an integration of the two, along with the development of a positive attitude toward science, in order to keep a balance. Care must be exercised not to substitute one for the other as a description of science.

The Earth Day Project

Both Ms. Brown's and Mr. Rose's science classes wanted to work together on a project for Earth Day, but they wanted it to last longer than just one day. They also wanted to do something out of the ordinary. After much discussion, someone suggested that the students do a study of water quality in their school district. The local public television station had a telecommunications network they could hook into for collecting data from students at the other end of the county 45 miles away. They looked at maps to locate water sources, learned how to do water tests, and recorded their data in a computer database. When they started to analyze the data, they found some discrepancies, so another team retested the water at those sources to verify the data. Finally, they made some recommendations to the water district council members about ways to improve the water in their area. Even though the original idea was to collect the information for the month before Earth Day, the classes decided to extend the project over a longer period of time. The students came back to Ms. Brown's and Mr. Rose's classes the next year to teach the procedures to the new students.

Methods of Science

Scientists systematically search for information that either supports or refutes their "best guess." This **method of inquiry** can be used by students of all ages or abilities. Memorizing "the scientific method" does not ensure that students can do science or understand the process. Hands-on experiences used to develop process skills and understand concepts are more apt to help students apply their knowledge to real-life situations and improve their attitudes toward science. These systematic procedures do not guarantee successful experiments; on the contrary, much has been learned in scientific study by analyzing "failed" experiments. The purpose of investigations is to discover what happens and to generate more questions, not to make the data fit the hypothesis or to change the hypothesis to match the data.



What is the inquiry method? One model follows:

1. **Question:** Why, how, and when does something happen? What are cause and effect? *(Hypothesize, predict)*
2. **Test:** Observe; collect, display, and interpret data; measure; identify and control variables. *(Experimental design; use of models, scale)*
3. **Analyze:** Predict, infer, draw reasonable conclusions.
4. **Revise:** Verify results, hypothesize. *(Redesign)*
5. **Test, analyze, revise:** Identify and control new variables; retest.

Analyzing the results of an investigation or experiment may generate new questions which could be the basis for further study.

Themes of Science

The major themes of science as identified in the academic expectations can be organized in a variety of ways throughout the student's educational experience. At all levels, Primary through grade 12, the disciplines of science provide topics for any of the themes. The following paragraphs offer one possible configuration of organization. No part of this model is required to be implemented; it is merely a suggestion.

The process skills identified in the Nature of Scientific Activity are the means to an understanding of the themes. Extensive development and sophisticated application of process, thinking, and manipulative skills are expected of all students. The application of these skills should be evidenced in all science disciplines, as well as in interdisciplinary studies such as environmental education.

Elementary

Fostering and guiding the natural inquisitiveness of children's early years lay the foundation for success in many later endeavors. As students gain experiences using the process skills, they progress toward higher levels of engagement.

The following are possible themes for the elementary years:

- Orderliness or organization
- Structure and function
- Variations and diversity
- Cause and effect
- Models
- Scale and perspective
- Systems
- Patterns of variations

Middle School

Science in the middle school deepens and extends the understandings begun in the elementary years. It should accentuate the interests of young adolescents in relating topics to personal use and applying practical problem solving. The conceptual development continues with more rigorous investigations and experiments that focus upon social issues involving individual responsibilities and decision-making. At this time, students should begin to understand the limitations of science and the importance of respecting differing points of view.

In addition to those for elementary school, the following themes can be added or more fully developed:

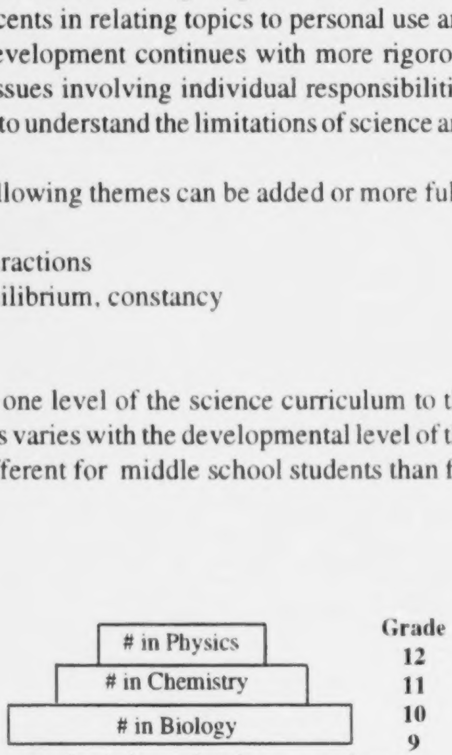
- Systems and interactions
- Stability and equilibrium, constancy
- Change

Even though the themes may be interwoven from one level of the science curriculum to the next, the development of the themes and their components varies with the developmental level of the student. For example, demonstrating observations is different for middle school students than for younger children.

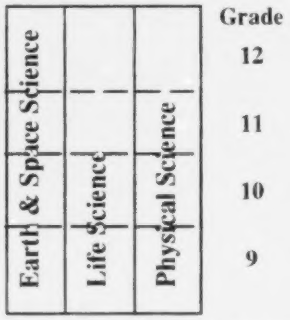
High School

Historically, the arrangement of science course offerings and the restrictions placed on student selection for those courses have had an impact on the breadth and depth of learning. A preset sequence of courses is often the only arrangement available to students. Separations within and between science disciplines are the norm; integration with other subject areas, even with logical connections such as mathematics, is rare.

In the publication *Science for All Americans* from the Association for the Advancement of Science (AAAS), an alternative perspective for organizing science in high school suggests shifting the emphasis from a narrow



Fewer students in each science, each year



Every student, every science, every year

focus on a single discipline to an interdisciplinary approach, which might be organized around environmental studies, the social sciences, or the study of systems. Yet another view of organizing science from the National Science Teachers Association supports the presentation of topics in all the natural sciences to every student every year. The high school curriculum, coordinated with the middle school and elementary science curricula, should be nonrepetitive and should progress from the concrete to the abstract over the entire span of high school.

In addition to those for elementary school and middle school, the following themes may be more fully developed:

- Models and scale and their interrelationship and
- Constancy, evolution, and their interconnectedness.

Designing a New Science Curriculum

One suggestion for the organization of the science curriculum takes into account the **developmental appropriateness** of certain concepts. For example, the study of patterns in life, Earth and space, and the physical sciences lends itself to development in the primary school much more than the study of constancy. However, concrete investigations of patterns lay the groundwork for the later study of more abstract concepts related to constancy. The science themes could be presented at each of the three levels - elementary, middle, and high school - with the topics used to explore those themes varying from year to year. In selecting topics or content, caution should be exercised to progress from concrete to abstract. Questions should be raised regarding the appropriateness of content traditionally used at certain grade levels. For example, is the study of atoms and molecules too abstract for elementary students? Are principles of physics and the activities that can convey those principles concrete enough for students in middle school? Among the criteria for the selection of content should be the allowance for **fewer topics and a more in-depth study** of those selected. Collaborative planning among teachers of all science levels, P-12, ensures a more integrated approach to developing the science curricula.

A second suggestion is to carefully **study the organization of topics** in science, especially at the high school level. Typically, biology has preceded chemistry which has preceded physics with fewer students enrolled in each subsequent class. As a result of that sequence and the demand for a high level of mathematics used in most current physics classes, many students have no further experience with principles of physics after middle school. Many also choose to enroll in a second or third course in the life sciences without having a single class in Earth and space or physical science.

It is recommended that science

- have a sequence appropriate to the learners' development;
- progress from concrete to abstract;
- explore topics from a variety of the natural sciences;
- be laboratory-based to connect concepts to hands-on experiences ;
- include interdisciplinary studies, such as environmental education and the social sciences; and
- be offered as part of every student's curriculum.

National Standards

Many efforts are underway to identify the concepts that all students should know and be able to demonstrate during and at the end of their experiences in science. Various interest groups within the science disciplines are writing curricula and developing assessments to accompany each curriculum. The National Research Council is bringing together representatives of science associations to develop coordinated standards for curriculum, assessment, and teaching. The timeline for the entire project extends over several years with an anticipated dissemination of the first document by 1994.

The American Association for the Advancement of Science is also in the process of developing *Benchmarks for Science Literacy*. They will give guidance to science educators when determining content for curriculum, assessment, and instruction. Drafts of early documents are being reviewed and revised based on comments from science educators across the country.

Representatives from Kentucky's science education community continue to collaborate with members of the National Science Teachers Association, the American Association for the Advancement of Science, the National Science Foundation, and other professional organizations to ensure a close alignment between the emerging national standards and Kentucky's expectations for students.

Closing Comments

In the selection and organization of the themes, concepts, and topics used in the curriculum, several words of caution should be heeded.

- The science curriculum should reflect what **all** students should know and be able to demonstrate. Science classes, comprised of hands-on experiences and heterogeneous groups, should be available to **all** students. In the sciences, it is important to emphasize the balanced, broad-based experiences rather than specializing in one area.
- Some topics presently included in elementary, middle, and high school science may be too abstract or even irrelevant to students' lives. Serious consideration should be given to a thorough examination of all topics, concepts, and themes as to their appropriateness for students.
- Efforts to ensure equity for minority students and girls in science and mathematics must begin at the elementary level. They must continue with middle school students who are beginning to explore career options and with high school students who are hesitant to continue in science.

Science, as a way of thinking, should be part of every person's repertoire. Learning the process skills and applying them to real situations are options all students should have. Schools must ensure that all students have access to science classes and have learned to apply the processes of science to problems and situations they will encounter in their lives. They also need to be prepared when making decisions regarding careers in science or science-related fields. Science provides the opportunities for students to develop problem-solving skills necessary to their everyday lives.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.1: Students understand scientific ways of thinking and working and use those methods to solve real-life problems.

Learning Links: Bird-watching / Surveys / Medicine / Journals / Mystery Stories / Mental Health / Interviews / Trial and Error / Engineering / Technology / Criminology / Forensics / Social Sciences / Choreography

Related Concepts: Observing / Inferring / Measuring / Identifying and Controlling Variables / Designing Investigations and Experiments / Verifying Results

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Design, conduct, and report an investigation or experiment.
- Identify variables that cause or influence an outcome.
- Infer and formulate explanations or predict an outcome based on data.
- Record and represent data in an organized form (e.g., tabular, graphic formats).
- Collect data by using a variety of observation techniques and measurement tools.
- Classify and order objects by one or more identifiable properties.
- Observe and communicate properties of objects or organisms using all senses.

Middle School Demonstrators

- Design and conduct a controlled experiment based upon student-generated observations and hypotheses.
- Identify significant variables that affect the outcome of an experiment and design controls for the experiment.
- Formulate models to illustrate or predict phenomena.
- Interpret data to infer relationships and apply to new situations.
- Construct operational definitions to explain concepts or facilitate experiments/investigations.
- Classify objects using multiple criteria.
- Communicate measurements made with common and advanced technological tools.

High School Demonstrators

- Design and perform an inquiry of a real-life situation which extends knowledge from a previous experiment or investigation.
- Use mathematical formulas to express relationships in new situations.
- Manipulate variables within an experiment to determine the effects of each on a phenomenon.
- Evaluate alternatives to the experimental method as a means of inquiry.
- Formulate a tentative conclusion based on limited data. Differentiate between correlation and cause-and-effect relationships.
- Evaluate a variety of quantified data to draw conclusions, infer relationships, and predict outcomes.

Sample Teaching/Assessment Strategies:

Collaborative Process: Peer Tutoring • **Community-Based Instruction**: Networking • **Continuous Progress Assessment**: Observation, Portfolio Development, Performance Events/Exhibitions • **Graphic Organizers**: Mapping/ Webbing, Venn Diagram • **Problem Solving**: Inquiry, Formulating Models, Simulations • **Technology/Tools**: Computers, Manipulatives • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Participate in a scientific study to solve a specific problem at a museum, zoo, or business.
- Invite a local author, poet, playwright, or artist to discuss nature stories and how he/she verifies information or does research before beginning a project.
- Participate in a monitoring network (e.g., Kentucky Water Watch Program) to investigate procedures used in research.
- Utilize environmental and outdoor educational facilities in your area (e.g., 4-H camps, YMCA camps, state/federal parks) as part of a project that involves data collection.

Core Concept: Nature of Scientific Activity

Sample Elementary Activities

- Identify a real-world problem (e.g., effects of soil acidity on seed germination, methods for erosion control) and design an experiment to test a possible solution. PE, OE
- Conduct experiments with plants, using soil, water, and sunlight amounts as variables. Record changes on a spreadsheet. Display results using computer graphics. PE, P
- Observe, chart, and explain changes that occur in an aquarium over a two-month period comparing factors such as sunlight, water temperature, plant life, and animal life. P
- Construct at least three different classification schemes (e.g., size, shape, color) for 20 or more building blocks. PE, OE
- Investigate the variables that affect the flight of a paper glider; then predict the effect of altering one variable. Verify or refute predictions. PE, P

Applications Across the Curriculum

Variations on a theme: Weather

Language Arts
- Listen, record, and/or collect different types of weather forecasts from newspapers, radio, or other sources. Analyze similarities and differences in reporting styles. P

Mathematics
- Observe, record, and graph daily weather for a specified time. Compare one set of collected data to that from another time. PE, P

Social Studies
- Correlate the topography of an area with its weather conditions. Use a topographical map to track a weather system across the country. PE, OE

Arts and Humanities
- Make musical instruments which mimic or represent weather sounds (e.g., rain sticks). Sing or play original or existing music which simulates weather sounds. P

Practical Living
- Illustrate relationships among climate, geography, and clothing styles. PE, OE, P

Vocational Education
- Investigate careers which are directly influenced by weather and invite people in those careers to class for a panel discussion about weather. PE, OE, P

Reflections

Science is a way of knowing. Through science, a systematic procedure for studying problems and investigating to find answers has been developed. The procedure includes elements such as observing, collecting information, organizing the information, inferring, and predicting. Using the process, rather than merely memorizing the procedural steps, should be the classroom focus.

Students should make decisions about how their questions can be answered as they progress through school. These skills developed in science are not only applicable to topics and investigations in science classes, but also to other disciplines, whether it is social studies, vocational education, mathematics, or the humanities.

Working through the processes of science, students develop an openness to new ideas, a curiosity about their work, a sense of fairness and cooperation, and the ability to weigh evidence and data to develop conclusions. These skills are valuable tools for students as they become proactive learners.

Source: American Association for the Advancement of Science -- Science for All Americans

Core Concept: Nature of Scientific Activity

Sample Middle School Activities

- Classify a variety of objects based on observable properties (e.g., size, shape, color, texture). PE, OE
- Design and conduct a controlled experiment to explain the effects of companion planting as a means of pest control. Establish operational definitions for terms that will facilitate this experiment. Evaluate the effectiveness of companion planting compared to the use of pesticides. PE, P
- Formulate hypotheses and design an investigation that illustrates the reaction of a population of invertebrate organisms to various stimuli. PE, OE
- Identify the variables that affect the movement of a pendulum and design an experimental model (e.g., a playground swing). PE, OE, P
- Classify subjects with one or more identifiable properties (e.g., size, shape, color, texture, material, form, composition) while participating in a field study at a science-related industry, art gallery, children's museum, farm, or zoo. PE, OE, P
- Develop a survey instrument and conduct a classroom or school poll on a topic of interest (e.g., favorite pizza toppings, class elections). Draw conclusions, make graphic representations, and share the results with the class. PE, OE, P
- Determine the percent of water in different brands of popcorn. Correlate the percentage of popped to unpopped kernels and that relationship to the percentage of water in the kernels. PE

Applications Across the Curriculum

Language Arts
- Write an article for a newspaper about the advantages of a hands-on science program. PE, P

Mathematics
- Determine the rate of flow from a single small hole in a water-filled, sealable plastic bag. Predict the amount of time needed for the bag to empty. Test your prediction. PE

Social Studies
- Compare the experimental scientific method with observation methods used by social scientists. Determine how the use of factual information is sometimes influenced by human perspective and/or emotion. P
- Analyze the political and economic systems of a foreign country by collecting and reading newspaper articles and observing trends. Make predictions about the country's future. OE, P

Arts and Humanities
- Design a futuristic musical instrument; communicate the mechanics of the design which produces sound. PE, P
- Listen to Holtz's *The Planets*. Compare the scientific and musical elements; create movement sequences illustrating the musical or scientific ideas. PE, P
- Determine the quantity of water needed to convert dry tempera paint to a fluid, opaque consistency. PE, OE

Practical Living
- Compare various cereal products for recommended daily allowances (RDA). Present results in chart form with recommendations for purchase. OE, P
- Test grooming products (e.g., soap, deodorant, toothpaste) for pH balance; interview appropriate specialists for recommended pH levels of products; determine which products are best for the human body. PE, OE, P

Vocational Education
- Determine the fat content of various types of meat and their relative digestibility. PE
- Investigate the volume of cooked and uncooked rice compared to raw and cooked pasta. Analyze any differences. PE

Core Concept: Nature of Scientific Activity

Sample High School Activities

- Design and carry out an experiment for the purpose of expanding existing knowledge developed through previous experimentation. For example, find an unresolved question in research materials and design an experiment to answer this question. PE, OE, P
- Examine a research article in a scientific journal. Identify the hypothesis, independent and dependent variables; study the data and evaluate the conclusions. PE
- Conduct a long-term water survey. Correlate fluctuations in biodiversity and other environmental influences with chemical analyses. PE, P
- Propose procedures a forensic chemist might follow to extract and identify blood samples. Simulate the scene of a crime; read the procedures for analysis to identify blood types. P
- Investigate treatment alternatives that may hold promise for individuals suffering from incurable diseases. Debate pros and cons of each treatment. P

Applications Across the Curriculum

Language Arts
- Compare the quality of the water systems serving your county using past and current copies of *Kentucky's Environment Report.* Prepare a presentation for your local town council. Include a position paper. PE, P

Mathematics
- Investigate a method to determine the diameter of the earth or the distance between the earth and moon using principles of geometry. PE, P

Social Studies
- Conduct a survey to obtain attitudes and reactions concerning global issues (e.g., genetic engineering, invitro fertilization); present ways that students can positively impact future decisions. P
- Assess a crisis situation where limited resources for survival are available (e.g., plane crash, new colony). Propose resources necessary for survival. OE, P

Arts and Humanities
- Communicate scientific discoveries by creating an original product or performance using music, visual arts, drama or dance. PE

Practical Living
- Test the air quality of the community, compare results to professional tests, and make recommendations based on the combined results. PE, P
- Conduct lab experiments on textiles to determine the effects of various stain-removal products and procedures. PE, P

Vocational Education
- Determine the pH level and needed nutrients of soil samples. Test types of plants best suited to specific pH levels.
- Investigate and compare the environmental and economic ramifications of using one item (e.g., aluminum, paper plate) recycled ten times to the cost of using ten new items. PE, P
- Design and conduct an experiment using leavening agents. Summarize findings. PE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.2:** **Students identify, analyze, and use patterns such as cycles and trends to understand past and present events and predict possible future events.**

Learning Links: Music / Language / Tangrams / Sentences / Quilts / Time / Statistics / Square Dance / Habits / Symmetry / Puzzles / Trends / Ethnicity

Related Concepts: Laws of Nature / Organic Cycles / Inorganic Cycles / Mathematical Patterns

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Make predictions (extrapolate and interpolate) based on patterns.
- Demonstrate relationships among patterns.
- Recognize, describe, and create patterns (e.g., repeating, developmental, behavioral, symmetrical, cyclical) of objects or events.
- Classify objects according to more than one property or attribute.
- Classify objects according to one property or attribute.
- Identify and communicate common attributes of items in a group.
- Use senses to observe items; communicate similarities and/or differences.

Middle School Demonstrators

- Investigate the relationships and interactions of two or more patterns.
- Investigate the existence of small-scale variations within a large-scale pattern.
- Formulate a pattern which represents an observed set of occurrences (e.g., data tables, equations).
- Analyze collected data to discover patterns and predict outcomes.
- Identify causes of observed patterns.

High School Demonstrators

- Predict trends or events, given sets of long-term or systemic data, and evaluate outcomes.
- Evaluate and represent possible correlations between sets of observed data.
- Demonstrate interrelationships among multiple cycles and one or more rhythms.
- Represent patterns using mathematical expressions.
- Compare and contrast regular, irregular, and cyclic patterns.

Sample Teaching/Assessment Strategies:

Collaborative Process • Community-Based Instruction: Networking, Field Studies • **Continuous Progress Assessment**: Portfolio Development, Performance Events/Exhibitions • **Problem Solving**: Inquiry, Formulating Models, Research, Interviews, Surveys, Polls • **Technology/Tools • Whole Language Approach • Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Have the local agriculture extension agent lead your class on a field study of erosion patterns and prevention.
- Invite a police investigator to the classroom to discuss DNA fingerprinting, patrol patterns, crime investigation, and composite photos.
- Utilize courthouse records to study shifts in local population patterns to predict future trends.

Core Concept: Patterns

Sample Elementary Activities

- Create sounds using natural or man-made objects and then try to duplicate those sounds using different objects. Group the objects by similarity of sound produced and identify the characteristics the objects have in common. PE, P
- Vary the volume of water in a bottle to determine the effect on the pitch produced. Use findings to predict the pitch produced by an untested volume of water. PE
- Create a symmetrical pattern (e.g., quilts, paper snowflakes, attribute blocks) after studying other patterns. PE
- Study a stack of cubes with a pattern and predict the cubes that could be added at the beginning and end of the sequence. PE, OE
- Collect items in nature that have a definite pattern (e.g., spider webs, leaves, fish scales) and design a classification system. PE, P
- Investigate patterns related to human activities (e.g., climate, sleeping habits, schedules) and represent them using computer graphics. PE, P
- Obtain five photos taken or selected at random. Create a story, poem, or song about patterns discovered in the pictures. PE, OE, P

Applications Across the Curriculum

Language Arts
- Illustrate a calendar with poems reflecting moods during the year. P

Mathematics
- Observe and compare geometric patterns in nature. Find examples of the patterns in manufactured items or architecture. PE

Social Studies
- Examine and classify patterns found in rural and urban settings. PE

Arts and Humanities
- Make rubbings of items collected on a nature walk and describe the patterns discovered. PE
- Create a sound pattern using rhythm instruments. PE

Practical Living
- Interview family, friends, and neighbors for past and present recycling behavior. Predict future environmental impact based upon the trend. PE, P
- Use a microscope to observe patterns made by the weave in different kinds of fabric. Test the strength of the fabrics. PE, P

Vocational Education
- Identify characteristics of eroding and non-eroding terrain. Suggest actions to correct the erosion. PE
- Survey a multi-generational family's history of the incidence of tooth decay. Hypothesize and analyze differences between generations. P
- Brainstorm ways patterns of family life change as the seasons change (e.g., food, clothing, family activities). PE, OE

Core Concept: Patterns

Sample Middle School Activities

- Use a spreadsheet to record and tabulate data showing the following relationships: (1) time of day to temperature, and (2) time of day to kilowatt hours of electricity used in your home or school. OE, P
- Collect, display, and analyze data showing relationships among age, gender, and growth of humans from ages 6 to 40. PE, OE, P
- Determine and compare relative densities of different objects (e.g., lead, wood, oil, plastic). Display findings using computer graphics. Analyze observed patterns. PE, P
- Predict the weather using data collected from observations and measurements. Include investigations about the relationship between cloud type and air pressure. Display findings. PE, P
- Construct a shadow stick (gnomon) and measure shadows generated. Graph the data using computer graphics. Make inferences or predictions using the information. PE, P

Applications Across the Curriculum

Language Arts
- Collect random observations from a walking tour. Classify the observations by one or more characteristics or properties. Display the observations and/or the classification system. PE, P

Mathematics
- Create a model of rabbit population growth to predict the number of rabbits after ten seasons. PE, P

Social Studies
- Analyze and chart economic patterns and cycles in American history, and explore interrelationships with concurrent political events. P
- Build a model rocket with a camera in the capsule. Use the rocket to photograph a land area. Examine the geographic features and create a scale model of the landscape from the photograph. PE, P

Arts and Humanities
- Create a museum display depicting or illustrating patterns evident in music, art, cultures, literature, drama, and dance. PE, P
- Draw visual patterns that you discover in nature (e.g., sedimentation layers, waves, crystals, honeycombs). PE, P

Practical Living
- Graph smoking and nonsmoking trends in the United States for the past 50 years. Analyze correlations in the research. OE, P
- Research the causes of the cycle of violence in relationships (e.g., dating, marriage, family). Investigate ways and means of breaking the violence cycle. Present findings to others (e.g., poster campaign for school awareness, article in school newspaper) P

Vocational Education
- Build a small motor and report on the effects of the magnetic field that cause the motor to run. PE, P
- Design disposable, environmentally safe packaging for an existing product. PE, P

Core Concept: Patterns

Sample High School Activities

- Predict future trends for environmental qualities (e.g., temperature, ozone, pollution) from evaluations of research data collected over a 100-year period. Access through telecommunications and CD-ROM. PE, P
- Determine the location of the epicenter of an earthquake by monitoring P and S wave patterns using a computer simulation. PE
- Predict oil consumption over a 100-year period using at least three different rates of increase by manipulating data recorded on a spreadsheet. PE, P
- Prepare a database to access information about chemicals found in the chemistry lab. Use software accessing MSDS (Materials Safety Data Sheet) forms to support the database. P
- Illustrate biological succession in your community (e.g., old field succession, pond succession, community succession) by producing a video. P

Applications Across the Curriculum

Variations on a theme: Urban Concepts

Language Arts
- Investigate and compare behavior patterns of literary characters who live in urban settings. Use literature from two distinct periods in history. PE, OE, P

Mathematics
- Design and conduct a survey on population growth and/or population shifts in selected urban areas. Process and report the information using a database. P

Social Studies
- Chart the changing nature of urban development (e.g., economic adjustments, territorial growth, demographic shifts). PE, OE, P

Arts and Humanities
- Create a museum display representing shifting urban population patterns. Include examples from music, art, literature, drama, and dance. PE, P

Practical Living
- Review typical urban family life cycle from time periods at least a century apart. Prepare a personal life cycle and compare it to those studied. PE, OE, P

Vocational Education
- Investigate trends in job types and availability in urban areas. OE, P

Reflections

Studying patterns gives students an awareness of the consistency of the universe. It establishes the basis for recognizing relationships, such as cause-and-effect and sequencing. Patterns are everywhere, and it is vital that students learn to make the connections necessary to see patterns and relationships. Some patterns, like the shapes of maple leaves from tree to tree, are obvious. Sometimes patterns are more elusive, such as the study of the pattern of ozone depletion geographically and over time.

As learners, students should be aware of constantly shifting and sorting information received through the senses, arranging and rearranging it in order to make connections. In this way, sorting and shifting, creating meaningful pictures of how things repeat, and looking for the way things are predictably connected, students seek and use patterns not only to learn new information, but also to interpret their world.

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.3: **Students identify and analyze systems and the ways their components work together or affect each other.**

Learning Links: Multicultural / Politics / Computers / Cities / Government / Transportation / Manufacturing / Communication / Climate / Stock Market / Agriculture / Machines / Conservation

Related Concepts: Contexts for Systems and Interactions: Biological (e.g., ecosystems) / Physical (e.g., electrical) / Social (e.g., manufacturing)

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Create a system.
- Investigate system feedback and self-regulation.
- Analyze how the properties of the components of a system affect their function within the system.
- Distinguish between systems and subsystems and describe interactions between them.
- Classify systems based on functions or properties.
- Communicate functions of a system.
- Identify components of a system.
- Recognize things that work together.

Middle School Demonstrators

- Design a new system or modify an existing one. Analyze the effects and limitations.
- Evaluate the effects of subsystems and their components on a system.
- Investigate the role of energy flow in systems.
- Demonstrate how a single system can have multiple functions and applications.
- Investigate and illustrate a system; identify its components and interrelationships with other systems.

High School Demonstrators

- Design and implement a series of systems with multiple subsystems to achieve an outcome.
- Differentiate between cause and effect in a malfunctioning system.
- Analyze the role of effective communication and feedback within and among systems.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies, Service Learning • **Continuous Progress Assessment**: Portfolio Development, Performance Events/Exhibitions • **Graphic Organizers:** Heuristics, Venn Diagrams • **Problem Solving**: Inquiry, Investigation, Experimentation, Simulation, Formulating Models, Research, Simulation • **Technology/Tools** • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- With the help of local officials study road, sewer, water, transportation, and telephone systems that serve your area.
- Invite local computer technology experts to present various computer systems.
- Ask a biologist, farmer, chemist, physicist, artist, or wildlife biologist to come to class to demonstrate and discuss interactions between humankind and nature.
- Ask a local city/county planner and an environmentalist to discuss the impact of development on the local environment.

Core Concept: Systems and Interactions

Sample Elementary Activities

- Using a variety of objects, design and construct a machine which can be used to elevate a box of books from the floor to a table. PE, P
- Identify subsystems in a habitat (e.g., pond, forest, aquarium) and investigate their interactions. PE, OE, P
- Complete an electrical circuit, identify its components, and describe evidence of their interactions. PE, OE, P
- Investigate the relationship among physical activity, breathing, and pulse rate. Use computer software to generate a 3-variable graph. PE, P
- Choreograph the movement and revolution of the earth to demonstrate the reasons why seasons change. PE, P

Applications Across the Curriculum

Variations on a theme: The Aquarium

Language Arts
- Build a class aquarium and keep a journal with daily observations. Describe evidence of interactions of subsystems within the aquarium. P

Mathematics
- Develop strategies to determine the amount of water in an aquarium. Consider the rocks, plants, and other matter in the aquarium. OE

Social Studies
- Design a flowchart illustrating a production/consumption chain for the class aquarium. PE, OE

Arts and Humanaties
- Listen to the song "I Know an Old Lady Who Swallowed a Fly." Rewrite to illustrate the interacting subsystems in the class aquarium. P
- Design and conduct an investigation to measure the effect of color, shape, and texture on fish behavior in the aquarium. PE, OE, P

Practical Living
- Develop a chart illustrating costs of purchasing and maintaining various aquaria. PE, OE

Vocational Education
- Invent a tool to help clean the aquarium more effectively or quickly. P

Reflections

"What is it made of?" "How does it work?" Investigating answers to these questions leads students to an understanding of the interconnectedness of all things. No single object, organism, or idea exists without influencing or being influenced by something else. For this reason, the study of systems and interactions is important for students. They can begin to analyze the pieces and parts of things and how they work together, whether they are working with systems in the human body, parts of a machine, or the ideas of an argument.

In The Fifth Discipline, Peter Senge discusses his concept of systemic thinking in which no one thing stands alone. Every single thing is connected in overt and covert ways to many other things. Through the study of systems and interactions, students can begin to understand that each object or person has an influence—large or small, intentional or unintentional—on the entire system. With encouragement, students will learn to extend this search to understand the ways their entire world is connected.

Source: Senge — The Fifth Discipline, The Arts and Practice of Learning Organizations

Core Concept: Systems and Interactions

Sample Middle School Activities

- Modify a circuit to do something different (e.g., ring a bell, flash a light). PE, OE
- Examine a system (e.g., machine, body system) which is malfunctioning. Speculate and infer the source of the problem, and suggest corrections and/or solutions. PE, P
- Evaluate and illustrate the relationship of human body systems by comparing them to the operations of a city. PE, OE, P
- Create/design an emergency alert system for the school to use during a power failure. Describe its strengths and limitations. Present the design to the principal and/or maintenance supervisor. P
- Investigate the impact of zebra mussels on fresh water aquatic ecosystems in the United States. Access research information through CD-ROM and/or telecommunications. P
- Invent a system to feed and water a pet while the family is on vacation. PE, P
- Design and build a telescope or microscope from common lenses and tubing. Determine limitations of the instrument when it is used in investigations. PE

Applications Across the Curriculum

Language Arts
- Design a brochure to persuade people to protect a local endangered species. Present data to support its niche in the biome. P

Mathematics
- Build models of polyhedrals while investigating crystalline structures. P

Social Studies
- Analyze the effects of geography on social or economic systems in various world countries on the same continent. OE, P
- Chart examples of social systems which are portrayed in television programs. P

Arts and Humanities
- Create a rhymed couplet to communicate body systems. PE, P
- Demonstrate the various systems of showing value (e.g., hatching, cross-hatching, pointilism, shading). P

Practical Living
- Conduct a field study at a facility involved in food production (e.g., farm, processing plant). Create models that describe the system investigated. P

Vocational Education
- Compare the engine of a car to the human body. Use schematics to show the comparisons. PE
- Make a graphic representation of the systems involved that trace a product from producer to consumer. PE

Core Concept: Systems and Interactions

Sample High School Activities

- Analyze the facts surrounding the issue of importing foreign species into this country and the impact on the environmental system. Identify the questions that must be answered regarding the sale of exotic animals as pets. Using desktop publishing software, write a newspaper article about your findings. P
- Explain how your body systems interact to allow the assimilation, utilization, and elimination of dye used in a diagnostic procedure (e.g., radioactive dye used in diagnosing kidney stones). PE, OE, P
- Evaluate the effects of a breakdown in one component of a system or subsystem (e.g., liver in the human body) on the system as a whole and on its interaction with other systems. PE, OE, P
- Investigate the laws of physics most often employed in amusement park thrill rides. Using computer software, design a thrill ride. P
- Create a system which employs various convex and concave mirrors to increase the intensity of a beam of light. Investigate practical applications of the system. Design a tool or device, using the procedure. PE, P

Applications Across the Curriculum

Language Arts
- Change a trait of a main character in a short story and rewrite the story using the new or enhanced trait. OE, P

Mathematics
- Determine the mathematical relationships that exist among the gears, gear ratio, gear size, distance, speed, and cadence of a multi-gear bicycle. P

Social Studies
- Illustrate graphically the variety of governments that have an impact on your life. P
- Illustrate how a law could be created through the local legal system. PE, P

Arts and Humanities
- Critique a professional performance (live or video) and identify the components (e.g., lighting, beat patterns of musical score, tonality of performers, design of the set) that created the holistic effect. Speculate how the mood or effect would change if components and their interactions had been designed differently. P
- Correlate a dance troupe's performing a ballet to a system, its components, and interactions. OE, P

Practical Living
- Research and track the health effects on humans of selected changes in the environment (e.g., a decrease in the ozone layer, herbicides that enter ground water). OE, P
- Illustrate the effects of smoking, drugs, and alcohol on prenatal development. OE, P

Vocational Education
- Design a warning label to be attached to a portable, multipurpose gasoline engine. PE, P
- For one month, record your blood pressure daily at the same hour. Also record your emotional state at that time (e.g., sad, happy, angry). Draw correlations between your emotional state and your blood pressure. P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.4: Students use the concept of scale and scientific models to explain the organization and functioning of living and nonliving things and predict other characteristics that might be observed.

Learning Links: Architecture / Photography / Transportation / Computer-Aided Design / Model Rockets / Maps / Musical Scores / Dollhouses / Theatre Sets / Flowcharts / Electric Trains / Sizing

Related Concepts: Models: Physical, Mathematical, Conceptual
Scale: Time Scales, Physical Dimensions, Measurement Scales (Fundamental and Derived Units)

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Evaluate appropriateness of components and scale to a real object being modeled.
- Investigate the significance of perspective.
- Use models to depict the function of an object, event, or system.
- Represent a real event, object, or concept with a model.
- Investigate models to determine how things work.
- Investigate models that represent objects, events, or systems.

Middle School Demonstrators

- Investigate properties that change or remain constant with changes in scale.
- Evaluate the functions, behaviors, and limitations implied by a model.
- Formulate multiple perspectives through the use of a model.

High School Demonstrators

- Represent an idea, structure, or system with various types of models (e.g., physical, conceptual, mathematical).
- Identify assumptions underlying a model and evaluate their effects on the appropriateness of the model.
- Evaluate the appropriateness of the scale of a model and its effects on the model's behavior.
- Use a model to analyze or predict behavior of objects, materials, or living things.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Conferencing, Self-assessment • **Graphic Organizers**: Advance Organizers, KWL • **Problem Solving**: Heuristics, Case Studies, Debate • **Technology/Tools**: Distance Learning, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit a planetarium to study available models of the universe.
- Locate local rocketry and/or airplane hobbyists who will demonstrate their models and explain how the different parts work together.
- Explore the use of topographical maps by different agencies in the community (e.g., phone company, gas company, soil conservation, municipalities, agricultural extension agency).

Core Concept: Models and Scale

Sample Elementary Activities

- Design and create a wave-generation system to investigate wave patterns, reflection, and refraction. P
- Create a topographic map of a 3-dimensional model of a hill, knob, or mountain. PE, OE
- Observe and illustrate a 3-dimensional object from different perspectives (e.g., top, front, bottom, sides). PE, OE, P
- Diagram the energy flow of a food web from the energy source to the final consumer. Include at least one producer, two consumers, and one decomposer in your diagram. PE, OE
- Find alternate routes to a specific location (e.g., home, cafeteria, playground). Draw a map to scale showing at least one route. PE, OE
- Construct a model of a building. Compare the model to a real structure. Identify the limitations and advantages of the model. P
- Compare photographs of objects to real things in terms of perspective, scale, proportion, dimension. Present your observations. PE, OE, P

Applications Across the Curriculum

Language Arts
- Create a body mask to represent a specific science concept. Write a story and use the mask to tell about the concept. P

Mathematics
- Map the school playground to scale. PE, P
- Draw a life-size model of a large animal (e.g., dinosaur, blue whale, elephant) in an open space (e.g., gym, ball field). Decrease the size of the drawing to a scale that will fit on an 8 1/2" by 11" sheet of paper. P

Social Studies
- Create a survey on a specific issue which samples a portion of the school population. Investigate various conclusions that might apply to the entire population. P

Arts and Humanities
- Observe and study types of cloud formations. Create models of the cloud types using various materials. PE, P
- Make a model of the solar system using other students to represent the planets. Choreograph movements to show the rotation of the planets and their moon(s). PE, P

Practical Living
- Design, build, label, and explain a cell model and its parts. PE, P
- Investigate the interactions that occur in a landfill by burying various types of trash (e.g., food, aluminum cans, styrofoam cups). Retrieve the trash after several months to observe the changes. PE, P

Vocational Education
- Prepare mock-up layouts of the school to help new students locate places and people. PE
- Use a sewing pattern to create a costume for a production. PE, P

Core Concept: Models and Scale

Sample Middle School Activities

- Design a scale model of an ideal middle school. Consult with an architect about your design. Present your plan to the school council or school board. PE, P
- Use simple machines to explain mathematical relationships (e.g., direct and inverse relationships). OE
- Investigate and describe the functions, behaviors, and limitations implied by body-system models. Use findings to determine the effectiveness of the models in communicating the concept. PE, OE, P
- Display various perspectives of a classroom (e.g., such as a teacher's view, students' views, the electrical system's view). PE, P
- Create a shadow box that allows viewing from multiple perspectives. Illustrate each perspective. PE, P
- Brainstorm various phenomena that could be modeled with a single object. P

Applications Across the Curriculum

Variations on a theme: Architecture and Design

Language Arts
- Create a database of analogies, similes, and hyperboles using architectural or construction terms (e.g., as hard as a rock). P

Mathematics
- Identify various structures whose designs are based on geometric shapes found in nature. Collect a series of pictures and draw the corresponding shapes to scale. PE, P

Social Studies
- Investigate the architectural environment of your community. Conduct a photo survey of the structures to compare style, age, and original purpose. Compile findings in a book for the local library. P

Arts and Humanities
- Compare the designs of various theaters and opera houses. Design a portfolio of the characteristics. P

Practical Living
- Chronicle the manner in which dollhouses have changed over the years. Build a futuristic dollhouse which incorporates designs you think will be part of a house in the 21st century. P

Vocational Education
- Design and build a scale model of a home typical of a foreign country. P

Reflections

Communicating an idea or concept to another person almost always involves using a model of some sort. It may be a three-dimensional representation of a cell or an analogy used to represent an idea. Why should students learn to use models? As they see the analogies created by teachers and are encouraged to create them for others, they learn to build models for their own learning. To investigate, design, and construct a model is to transform the abstract. It is one thing to imagine and to visualize an idea, it is quite another to actually communicate that image. Mental models serve the same purpose as the tangible ones. If students can create an accurate model, they can demonstrate what they have learned to someone else.

Constructing any model means paying attention to the original and using a scale which will accurately communicate the essential relationship among the elements being studied. The more accurate the relation of the model to the original, the greater the learning that results. Learning to make decisions about the scale and design of a model helps students see and interpret their world more accurately and fully.

Source: McKim— Thinking Visually: A Strategy Manual for Problem Solving

Core Concept: Models and Scale

Sample High School Activities

- Create models of bridges, and test the structures to identify which one functions best. PE
- Develop two different types of models illustrating homeostasis. PE, P
- Redesign a model to a different scale (e.g., airplane, map); defend the appropriateness of the new model for a specific purpose. P
- Compare models used in the evolution of the atomic theory. OE
- Demonstrate and explain the effects of the volume of water, slope of a river, and substrate materials on a river's ability to erode the landscape. Use a stream table and document the demonstration in video form. P
- Use a recipe to illustrate stoichiometry (quantitative chemical properties and composition). PE
- Design and construct two types of models (mathematical, conceptual, physical) which illustrate the relative position and motion of the earth, sun, and moon. PE, OE, P

Applications Across the Curriculum

Language Arts
- Rewrite an early science fiction story using up-to-date, accurate information. OE, P

Mathematics
- Create a mathematical model representing the energy of an ocean wave. PE
- Use geometry to predict the position of the moon in the night sky at a given time based on the angular relationship of the moon, earth, and sun. Draw the corresponding moon phases visible from your location on the earth. PE, P

Social Studies
- Construct a model of a landfill that would reflect community needs and concerns. P
- Plan a political campaign for an elected official. Include illustrations of strategy, special events, schedules, and budgets. P

Arts and Humanities
- Create scale drawings of a stage setting for a school performance. Build a model from the drawings. PE, P

Practical Living
- Explore the concept of levers by determining the optimal limb and trunk position needed to generate maximum force production during weight-training exercises. P
- Create a scale model of a futuristic home. Design both the interior and exterior of the home. P

Vocational Education
- Design a program to lower the body's "set point" by ten pounds. Include maintenance procedures. P
- Build a geodesic dome. Investigate its effectiveness as a greenhouse design. PE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.5:** **Students understand that under certain conditions nature tends to remain the same or move toward a balance.**

Learning Links: Instinct / Friendship / Balance / Time / Communication / Pi π / The Past / Emotions / Learning

Related Concepts: Physical Constancy (e.g., gravity, speed of light)
Biological Constancy (e.g., cell division, growth)

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Investigate factors which may disrupt constancy and describe their effects in a steady state system.
- Investigate and describe steady state systems and components of a system that work together to achieve constancy.
- Describe an event or system that includes a constant process.
- Identify, observe, and communicate recurring events.

- Apply constancy concepts to make hypotheses and predictions.
- Investigate the characteristics and effects (e.g., nature, size, frequency) of a disruption to a steady state system.
- Analyze the relationship between scale and the appearance of constancy.
- Analyze the relationship between change and constancy.

- Analyze the processes which return a system to equilibrium following a disruptive occurrence.
- Analyze the relationships between cyclic subsystems and negative feedback as they contribute to the maintenance of equilibrium.
- Predict outcomes of a real-world situation, using universal laws.
- Analyze the concept of conservation in the universe.
- Evaluate systems to determine if they are steady state.

Sample Teaching/Assessment Strategies:

Collaborative Process • **Community-Based Instruction**: Service Learning, Networking, Mentoring • **Continuous Progress Assessment**: Anecdotal Records • **Problem Solving**: Investigation, Simulation, Formulating Models • **Technology/Tools** • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit one of the planetariums in Kentucky and investigate the constancy of the universe over time.
- Invite a soil conservationist, agriculture extension agent, or park ranger to explain how, why, and when system design is sometimes necessary to control erosion.
- Invite a representative of the Environmental Protection Agency (EPA) or Natural Resources and Environmental Protection Cabinet to demonstrate how pollution is detected, monitored, and corrected.

Core Concept: Constancy

Sample Elementary Activities

- Identify the self-regulating components of a system in your home or community that work to achieve a balance (e.g., thermostat on a heating system; traffic lights to control traffic patterns; time periods in sporting events). PE, OE
- Graph sunrise and sunset times for a period of 14 days. From the data, predict the sunrise and sunset times for each day of the following week. Verify your predictions by data collection. P
- Correspond with a pen pal in Hawaii via telecommunications. Describe and compare the sequence of seasonal changes in Kentucky and Hawaii. Analyze the effect on daily routines. OE, P
- Make a chart depicting your daily routine. Identify and record patterns. P
- Determine the influence of light and gravity on seed germination and growth. Use the information to select the best place in the school to grow plants. OE, P

Applications Across the Curriculum

Language Arts
- Read different versions of favorite fairy tales to determine elements which remain the same. Analyze why some elements changed. OE, P

Mathematics
- Compare your weight on Earth to your weight if you were on the moon or another planet. Analyze reasons for any differences noted. OE

Social Studies
- Analyze a report on the ability of the environment to rebound after a major disaster (e.g., volcanic eruption, oil spill, hurricane). OE, P

Arts and Humanities
- Create a mural illustrating your classroom without gravity. PE

Practical Living
- Illustrate how pulse varies around a stable norm. Collect data while sitting, lying down, working, and standing during different times of the day. PE, P

Vocational Education
- Record and graph a six-second pulse count daily for one week. Explain observations. P
- Identify local endangered species. Present findings of efforts to bring them to a relatively constant state. P
- Investigate homeostatic examples within a body (e.g., body temperatures). P

Core Concept: Constancy

Sample Middle School Activities

- Describe the probable appearance of the night sky in 500 and 5000 years when viewed from a specific latitude. OE
- Analyze the components of plate tectonics to describe why the earth's surface area remains constant even though the surface changes. Access supporting information using CD-ROM. OE, P
- Predict the position of one of the planets in our solar system in 90 days and 90 years (Earth time) by applying concepts of constancy and using the rate of its revolution. PE, P
- Communicate via telecommunications with a pen pal in the Southern Hemisphere. Explain how the motion of the earth affects stellar and lunar observations and the seasons from each location. P
- Investigate and explain what happens when effervescent antacids are placed in water. Use a balance and the Laws of Conservation to justify the explanation. PE, P
- Communicate the manner in which topography influences changes in weather even though the climate of an area remains relatively constant. OE, P

Applications Across the Curriculum

Language Arts
- Design an investigation to demonstrate to a primary student why there may be a difference in temperature between the deep and shallow water of a swimming pool. PE, P

Mathematics
- Create a balsa wood structure at least .5m tall to support 2kg of mass. Explain why one particular infrastructure design works better than another. PE, P

Social Studies
- Explore the disruption in South Africa's long-standing apartheid system of government. Produce a fictional diary of life before and after the governmental change. P

Arts and Humanities
- Investigate the relationship between noise and music. PE, P

Practical Living
- While performing static and/or dynamic balances (e.g., balance beam, skate board), explore and demonstrate the principle of the center of gravity. OE, P

Vocational Education
- Maintain a 90-day mood chart to identify a pattern of constancy of your emotions. P
- Evaluate global conservation practices and use of natural resources. Compare to local practices. P
- Examine x-rays of a fracture taken throughout the healing process. Observe and analyze the steps in the healing process. PE, P

Core Concept: Constancy

Sample High School Activities

- Create a computer simulation to demonstrate how alterations in input affect the output of chloroplasts during photosynthesis. Predict implications of the effect on agriculture. P
- Assume the role of a United States patent office reviewer; respond to a proposal for a machine which claims to produce more energy than it consumes. Justify your decision to accept or reject the patent. PE, OE, P
- Describe the processes that take place in body systems as they return to homeostasis following the ingestion of large quantities of concentrated sugar solutions during diabetes diagnostic tests. PE, OE, P
- Predict the climate in Kentucky 100 years from now, assuming current trends in ozone depletion and global warming continue. P
- Present a chemical magic show illustrating a variety of science concepts to a primary classroom. PE, OE, P

Applications Across the Curriculum

Variation on a theme: Disasters

Language Arts

- Read a variety of fictional and nonfictional accounts of a major disaster. Analyze the similarities and differences of the responses of the victims. OE

Mathematics

- Chart the frequency of occurrences of a particular type of natural disaster in a specific geographic region. Research possible explanations for the causes. PE, P

Social Studies

- Analyze a report on the ability of the environment to rebound from a major disaster (e.g., volcanic eruptions, oil tanker spills, hurricanes). PE, OE, P

Arts and Humanities

- Locate examples, using a CD-ROM, of natural disasters depicted in art. Create a HyperStack of the examples according to personally developed criteria. Use the HyperCard stack as part of a multimedia presentation. P

Practical Living

- Prepare and distribute a pamphlet of quick-response community agencies and services which could be used in the event of a community disaster. P

Vocational Education

- Volunteer to be part of an emergency response or disaster readiness team in your community. P

Reflections

"The only constant is change." As students study any system which is attempting to maintain equilibrium, they discover the interrelatedness of constancy and change. Systems may range from a spinning gyroscope to a person's mental health, from a nuclear reaction to the weathering of mountains. Trying to determine if a system is in a state of balance requires the application of the processes of science—observing, collecting, recording, and interpreting data.

Using the skills involved with determining constancy can challenge a student to look for balance in many aspects of learning. The idea of constancy is a viable candidate as a theme for a cross-disciplinary unit.

Change is also an element of constancy that must be integrated into the study of steady state systems. Without looking at how things change, students may not understand how they stay the same, nor understand the broad truth of the saying "The more things change, the more they remain the same."

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.6: **Students understand how living and nonliving things change over time and the factors that influence the changes.**

Learning Links: Civilization / Computers / Language / Agriculture / Artistic Design / Music / Knowledge / Communication / Travel / Exploration / Communities / Culture / Revolution

Related Concepts: Life Changes / Adaption / Natural Selection / Physical and Chemical Change / Radioactive Decay / Erosion

Elementary Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Describe situations where one change causes another change.
- Investigate variables that influence change over time (evolution).
- Describe the sequence of steps in a change process.
- Identify and predict small and large scale changes.
- Observe and communicate change over time (evolution).

Middle School Demonstrators

- Evaluate the impact of a disruption on the evolution of a system.
- Predict the future state of an evolving system.
- Investigate evolutionary change, and evaluate factors (e.g., random and predictable) responsible for change.
- Illustrate evolution in a variety of contexts (e.g., biological, physical, social).

High School Demonstrators

- Propose and defend a change that redirects evolution.
- Evaluate how change in one system influences change (e.g., small and large scale) in another.
- Analyze factors that influence the evolution of a system.
- Demonstrate how sequence and rate affect change in a system.

Sample Teaching/Assessment Strategies:

Collaborative Process: Reciprocal Teaching • **Community-Based Instruction**: Service Learning • **Continuous Progress Assessment**: Portfolio Development, Anecdotal Records, Self-assessment • **Graphic Organizers**: Flowchart, Storyboard • **Problem Solving**: Brainstorming, Future Problem Solving • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a grandparent to class to share photographs of his/her family members' personal characteristics, clothing styles, and hair styles, and how these have changed over time.
- Survey the community for changes in architectural styles of homes, office buildings, and schools.
- Invite a retired physician, a practicing physician, and a recent graduate to discuss differences in medical diagnoses and treatments.

Core Concept: Evolution

Sample Elementary Activities

- Examine and discuss drawings of M.C. Escher (tessellations). Create a drawing or word puzzle that shows minor changes which become more evident over time or space. PE, P
- Conduct an environmental impact study on the location selected for a new school. PE, P
- Investigate the effects of placing ice cubes in different locations for melting (e.g., in a cup, in water, in sunshine, on the table, in your hands). Construct an ice cube keeper, evaluate its effectiveness and communicate the results. PE
- Take pictures or collect artifacts or other data which shows the decay of a leaf, food, log, or tree. Illustrate the role of decomposition in the food and mineral cycle. P
- Compare a person's present physical characteristics to his/her baby picture. P

Applications Across the Curriculum

Variation on a theme: Evolution of the Individual

Language Arts
- Analyze changes in a character from the beginning to the end of a novel. PE, OE, P

Mathematics
- Create a time line of events in your life. PE, OE, P

Social Studies
- Identify and predict short-term and long-term changes in yourself. OE, P

Arts and Humanities
- Prepare a photographic biography or autobiography. P

Practical Living
- Develop a personal plan for physical conditioning and chart the results over time. PE, P

Vocational Education
- Investigate the changes in equipment for sports or personal physical fitness in a 20-year period. PE, P

Reflections

As students become familiar with the evolutionary process in traditional, academic study units, they become acutely aware of the change process and the implications of change. Studying the change in a car's noisy engine, in the history of an ancient civilization, or in the behavior of a weather system helps students grasp the entire concept of change and the application of this scientific principle to other aspects of their studies and their lives. Scientific processes are applied throughout the study of change because so much depends on questioning, testing, analyzing, and revising information to determine whether change exists, or the degree to which it is occurring.

The study of change, whether considered macrocosmically or microcosmically, is significant to the understanding of systems and their interactions, identifying patterns, and recognizing constancy. Studying causes and effects of change leads to an awareness of the constancy of change itself.

Core Concept: Evolution

Sample Middle School Activities

- Investigate a physical change in the local environment; document (e.g., series of pictures) the changes; measure the rate of change; describe the causative agents, and predict future changes based on the investigation. PE, OE, P
- Design and conduct an experiment to examine the effect of various factors (e.g., sunlight, water, vinegar, air) on the rate of decay of different kinds of trash (e.g., plastic, paper, organic). PE, OE, P
- Predict and model the possible location of the earth's land masses one million years from now. Defend your predictions using computer simulations. OE, P
- Predict the size of a tree, in five-year intervals, based on tree-ring data and climatic influences. OE
- Illustrate the evolutionary process of ocean sand as it makes its journey from a mountain rock. OE
- Collect fossils and compare them to similar organisms found today. Infer conditions which caused observed changes. P
- Locate and describe examples of evolutionary changes in our world today (e.g., technology, political systems, populations). OE, P

Applications Across the Curriculum

Language Arts
- Create an exhibit of changes in fads among teenagers over the past 50 years. Include written explanations. P

Mathematics
- Compare the present graduation requirements in mathematics to requirements before 1980. P

Social Studies
- Trace a fictional or historical person's family tree to analyze the evolution of cultural practices, changes in customs, family lifestyles, or parenting routines through successive generations. P

Arts and Humanities
- Hypothesize the effects of acid rain on architectural structures. Design an investigation to test the hypothesis. PE, OE, P
- Use a "morphing" computer program to change images of objects or people in your class. P, PE

Practical Living
- Brainstorm to identify items (e.g., telephone, television, cars, computers) that have evolved quickly. As a result, examine how each has improved or changed human life significantly. OE, P
- Research the evolution of common products, trends, and fads. P

Vocational Education
- Chart the evolution of the computer. Predict possibilities of applications of computers in the future. OE, P
- Prepare a time line of types of communications (e.g., percussion, written, electronic) from prehistoric times to the present. P
- Research the history of some aspect of health (e.g., anesthesia). Prepare a mural, series of cartoons, or drama showing stages of development. P

Core Concept: Evolution

Sample High School Activities

- Write a proposal requesting research funds for a town that has an epidemic health problem related to mosquitoes and an environmental problem related to insecticides. P
- Predict the issues which might be encountered by a research team in 2061 that has discovered, through bioengineering, a way to extend the human lifespan by approximately 25 years. Debate the economic, health care, cultural, political, and ethical ramifications of publishing and implementing the technique versus destroying your work. PE, P
- Predict how the depletion of the ozone layer is likely to affect you at age 50 if the present rate continues. Present the predictions in the form of a short story. P
- Do a qualitative analysis on an effluent of a local industry. PE, OE, P
- Investigate an existing system (e.g., economic, technological, political) in your community; analyze factors influencing its evolution, and communicate the impact of the change on the community as a whole. P
- Examine and illustrate graphically the correlations of a stream's velocity and width to its age. P

Applications Across the Curriculum

Language Arts
- Chronicle the evolution of the detective mystery story. P

Mathematics
- Graph a mathematical function to demonstrate entropy. P

Social Studies
- Interview representatives of governmental agencies to assess the changing role of government since 1900. Compile the interviews into a single video. P
- Debate whether scientific advancements solve problems or create new ones. PE, P
- Correlate the evolution of manufacturing, communication, and travel to the changing lifestyles of Americans over the last 200 years. P

Arts and Humanities
- Create a photo essay or a documentary which depicts the evolution of something of personal interest (e.g., world history, communication, entertainment, science). PE, P

Practical Living
- Research the evolution of incidence of HIV/AIDS among teenagers. Present your data graphically from various predictions based upon the possible social approaches to the problem. OE, P
- Create clay models depicting the stages of prenatal development. PE

Vocational Education
- Examine the changes in procedures used to improve specific characteristics in breeds of various animals and plants. P
- Research and report on the historical development of the concept of preventive medicine. Analyze past practices in light of present knowledge. P

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Mathematics

Mathematics

TESTIMONIAL FROM THE MATHEMATICS CLASSROOM

When I started teaching, I modeled my teaching style after my former teachers. I followed curriculum guidelines and covered as much of the textbook as possible. I was a chalk-and-talk teacher who taught skill-and-drill mathematics. I explained and worked examples for my students and then assigned problems from the textbook. I honestly felt I was being an effective teacher. But I worried about the students who did not participate, who gave up easily, and whose answers made no sense at all. These students showed a lack of confidence in their skills and their abilities to do mathematics. They were also bored with the never-changing routine of the traditional mathematics classroom. I began to think about ways to engage all my students.

I realized I had to focus less on covering the material and more on students' understanding of the mathematics concepts. I observed that not all of them learn through lecture and sitting in straight rows. Since they enjoyed working together, I tried letting them work in cooperative groups with hands-on activities which allowed them to demonstrate their understanding of the concept and the way it applies to real life. Through professional development and working with colleagues, I learned to incorporate writing to give students opportunities to communicate.

Now, to accommodate my students' varied learning styles, I routinely use manipulatives, videos, field studies, computers, and calculators in my classroom. New methods of assessment, such as performance events and open-response questions, also allow students to demonstrate what they have learned. Each student keeps a working folder, and through conferencing, we screen the contents periodically and move entries to their mathematics assessment portfolio.

My students have some choices as well as input, and I believe that they have a better understanding of mathematics. I will continue to grow with them and try new ways to provide opportunities for success.

Mathematical Power For All Students

Mathematics must become a pump rather than a filter in the pipeline of American Education...More than any other subject, mathematics filters students out of programs leading to scientific and professional careers. (7)*

The objective of mathematics education envisioned in the two National Council of Teachers of Mathematics (NCTM) standards documents–the *Curriculum and Evaluation Standards for*

School Mathematics and the *Professional Standards for Teaching Mathematics*–is the development of mathematical power by ALL students. Features of this new power in mathematical learning include the following ideas adapted from the Mathematical Sciences Education Board (MSEB):

- Mathematics is much more than mere computation.
- Communicating–reading, writing, and speaking–is a basic mathematical skill.
- Mathematics helps students understand and explain the world.
- Fingers and counters are great tools for doing simple mathematics.
- Calculators are to pencil and paper what automobiles are to horses.
- All students can learn more mathematics through hands-on activities.
- Mathematics is learned better in groups.
- To know mathematics is to do mathematics.
- Mathematics done in school should be like mathematics used outside school.

Mathematical power means being able to explore, conjecture, reason logically, and use a variety of mathematical methods effectively to solve nonroutine problems. Students should participate in varied interrelated experiences that result in their

- learning to value mathematics,
- becoming confident in their ability to do mathematics,
- becoming mathematical problem solvers,
- learning to communicate mathematically, and
- learning to reason mathematically.

Goals For An Information Society

"By the end of the century, approximately two-thirds of all work will be information work."

Harland Cleveland
Dean of the Hubert Humphrey School of Public Affairs
University of Minnesota, 1985

Mathematics is the language of the 21st century. In this "Information Society," computers, videos, and television have become dominant technologies. Today, the ability to understand and use mathematics is as important as the ability to read. New societal goals for education include 1) mathematically literate workers, 2) lifelong learners, 3) equitable opportunities, and 4) an informed electorate. All citizens will need to have mathematical skills to understand financial reports, political polls, debates about AIDS testing, the federal deficit, probabilistic inferences such as DNA fingerprinting, environmental issues, and the concepts of chance. Daily bombardment with conflicting quantitative information requires awareness of both the power and the limitations of mathematics. In tomorrow's world the best opportunities for jobs and advancement will go to those prepared to address quantitative, scientific, and technological issues. Mathematical power provides the key to these opportunities.

KERA Goals For Learning Mathematics

As mathematics becomes more than calculation, education in mathematics must become more than mastery of arithmetic. Geometry, measurement, chance, and data analysis are as important as calculation in achieving mathematical power. To prepare students to use mathematics in the 21st century, today's curriculum must invoke the full spectrum of the mathematical sciences. The six KERA learning goals support these expectations for the mathematics curriculum.

Mathematics spans all KERA learning goals. In Goal 1 students apply mathematics skills in processing information and ideas. The Goal 2 mathematics concepts – **number, procedures/operations, space and dimensionality, measurement, change, mathematical structure, and data** (probability and statistics) – were developed from the NCTM *Standards* and the National Academy of Sciences publication *On The Shoulders of Giants*. Some of these concepts are content-oriented; others are process-oriented. Students need opportunities to work independently (Goal 3), collaboratively (Goal 4), in problem-solving situations (Goal 5), and in real-life situations (Goal 6) using the skills and concepts from Goals 1 and 2. Only in this context will all students meet the high expectations set by KERA and be successful and confident in themselves as learners.

Assumptions About Students Learning Mathematics

> *One can hardly blame students for not becoming interested in mathematics if they rarely see evidence of its full power and richness.* (43)*

The following assumptions were made in the development of the NCTM *Curriculum and Evaluation Standards for School Mathematics***. They also governed the shaping of the Kentucky mathematics academic expectations which are closely aligned with the *Standards*. To transform the mathematics classroom into a hands-on, minds-on environment, the mathematics community

assumes that all young children

- like mathematics;
- do mathematics naturally;
- have a positive attitude toward mathematics;
- see and discover patterns;
- make conjectures based on observation;
- have confidence in themselves and enthusiasm for doing mathematics;
- need to use manipulatives, calculators, computers, and other tools to solve problems; and
- make natural connections between mathematics and other subjects.

assumes that middle school students

- need a mathematics curriculum which engages students physically and intellectually;
- need to explore and make sense of their world;
- need a mathematics curriculum with a broad, integrated view;
- need to experience the full breadth of relevant mathematics;
- need to see the interrelationship of mathematics with technology;
- are motivated by real-world problem situations;
- need to understand numerical and spatial concepts to prepare them for more abstract mathematics; and
- need to make connections between mathematics and other subjects.

assumes that high school students

- will have experienced mathematics in the context of the broad, rich curriculum outlined in the K-8 NCTM *Standards*;
- need enrichment and extensions of a variety of content;
- need to investigate and solve problems in real-world contexts;
- need to experience a curriculum which emphasizes conceptual understandings, multiple representations, mathematical modeling, and problem solving;
- need to use graphing calculators and computer utilities; and
- must be equipped with options for further education and career changes.

Throughout grades P-12, a variety of instructional methods should be used in classrooms in order to

- cultivate students' abilities to investigate, make sense of, and construct meanings from new situations;
- make and support arguments for conjecture; and
- use a flexible set of strategies to solve problems from within, across, and outside mathematics.

Implications For Developing Local Curricula

Overlapping Topics and Demonstrators

The KERA academic expectations for mathematics are a mixture of content and process. Just as the academic expectations overlap, so do some of the demonstrators. It is not possible to place each demonstrator under just one academic expectation to the exclusion of all others.

For example, the demonstrator "Extend and create patterns and generalize structures from patterns" could be addressed in all of the following academic expectations: **Number, Procedures, Measurement, Space and Dimensionality, Change**, and **Structure**. Examining the classification of quadrilaterals could be a patterning activity under either **Structure** or **Space and Dimensionality**. Also, demonstrators related to patterns, functions, or properties could be referenced under either **Change** or **Structure**.

The goal in the development of the mathematics demonstrators, regardless of their categorization, is that students have the opportunity to experience all mathematical topics. At the local level, curriculum developers need to address this issue.

Developmental Design

Teachers should note that on each Goal 2 mathematics demonstrator page, an attempt has been made to write an entry level demonstrator at the bottom left of the elementary column and an exit demonstrator at the top right of the high school column; however, all demonstrators are **not** presented sequentially. (Refer to the format explanation and graphic on page 10).

In learning all mathematical content, students should move developmentally from the use of concrete and pictorial representations to more abstract thinking. For example, under **Data**, students do not have to construct displays of data before they can formulate problems that involve data; however, developmentally, they should move from tallying and counting to plotting and graphing. As another example, in studying **measurement**, students should first identify measurable attributes of objects and use nonstandard and standard units before applying and deriving formulas for measurement applications. There is also an appropriate developmental sequence in studying **space and dimensionality** (geometry). The van Hiele model (1984) describes five levels of geometric development which progress from visualization through analysis to formal aspects of deduction.

In the past, estimation was not considered an integral part of school mathematics. Its importance has been recognized as it interacts with number sense and spatial sense to help children develop insights into concepts and procedures. Estimation needs to be an ongoing part of the P-12 curriculum. It is not a "topic" to be taught in isolation within an academic expectation, but should be threaded through all mathematical topics.

As teachers develop their own curricula, the above factors should be considered. The goal is to provide all children with a rich, meaningful background in mathematics.

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*from *Everybody Counts: A Report to the Nation on the Future of Mathematics Education*, National Research Council, 1989.

****Curriculum and Evaluation Standards for School Mathematics*, National Council of Teachers of Mathematics, 1989.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.7: Students understand number concepts and use numbers appropriately and accurately.

Learning Links: Astronomy / Polls / Population Studies / Elections / Life Cycles / Lotteries / Economic Trends / Stock Market / Temperature / Banking / Recipes / Sports Statistics / Travel

Related Concepts: Multiple Representations / Mathematical Notation / Number Relations / Equivalent Forms / Number Sense / Estimation / Ratio / Infinity / Number Theory / Limit / Number Systems

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Recognize integers.
- Investigate, model, apply, and communicate multiple representations of whole numbers, fractions, and decimals.
- Explore estimation strategies and determine when an estimate is appropriate.
- Construct number meaning and interpret the multiple uses of numbers through real world experiences emphasizing the relative magnitude of numbers.
- Investigate number systems (zero, grouping, and place value) and operations.
- Explore, group, identify, and classify sets of objects without numbers and then with numbers.
- Count forward, count on, count back, and skip count.

Middle School Demonstrators

- Investigate infinite progressions using number lines and geometric representations.
- Investigate models of irrational numbers (e.g., pi, square roots).
- Use estimation to check the reasonableness of results.
- Develop and apply number theory concepts (e.g., factors, primes, multiples).
- Interpret and use appropriate mathematical notation for numbers (e.g., %,!, /, √).
- Model, communicate, and apply multiple representations of rational numbers.
- Explain, demonstrate, and model positional value (place value, exponents, number line, scientific notation).

High School Demonstrators

- Investigate and communicate the concept of limit.
- Recognize situations which can be represented by complex numbers.
- Communicate, model, and apply multiple representations of real numbers.
- Determine reasonableness of results by estimation.
- Justify and communicate answers and solution processes.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Networking • **Graphic Organizers**: Mapping/Webbing • **Problem Solving**: Brainstorming, Inquiry, Questioning, Future Problem Solving, Formulating Models • **Technology/Tools**: Manipulatives, Games • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite individuals to class whose careers involve working with numbers (e.g., banker, accountant, IRS representative, delivery agency employee, or sports statistician) to discuss the importance of numbers.
- Serve as interns within city hall and help the town clerk with bookkeeping.
- Ask a representative from an agricultural agency in the community to discuss livestock marketing and margins of profit for different animals.
- Participate in a variety of organized mathematics challenges/competitions (e.g., KCTM Math Bowl, Math Reach, MATHCOUNTS).

Core Concept: Number

Sample Elementary Activities

- Make a special book that contains information about numbers (e.g., age, height, phone, strength). P
- Estimate how large a scale model of the United States would have to be if 1" represents 1 mile. Determine the actual distance using a trundle wheel to mark off length. Adapt scale to fit a smaller area. PE, P
- Divide a set (group) of raisins into fractional parts (e.g. , equally divide the group of raisins into three parts). Extend by showing raisins to represent a decimal (from a set of 10 or 100 raisins). PE
- Play the donut factory game. Roll number cubes to collect a number of donuts (Cheerios) and package them into sets of 5 using portion cups. After collecting 5 portion cups, place into a carton (plate). The object is to fill a carton. This may be played in any base. PE
- Show 10 ways to model the number 45 by using manipulatives (e.g., base 10 blocks), pictures, and writing. Communicate and compare the representations. OE, P
- Identify the different ways numbers are used in a newspaper. OE
- Determine different ways to estimate the number of beans in a jar. OE

Applications Across the Curriculum

Variations on a theme: Recipes

Language Arts
- Watch someone preparing one of your favorite foods. Write a description to tell someone how to prepare the recipe. PE, P

Science
- Estimate the amount of ingredients necessary to feed your class or school a favorite food. OE

Social Studies
- Find and prepare a recipe written using metric measurements. PE

Arts and Humanities
- Prepare a classroom cookbook of favorite foods. Include drawings or photos, tasting reviews, and recipes. Classify the recipes in a variety of ways. PE, OE, P

Practical Living
- Compare grams of fat, sugar, and nutrients of selected recipes from your cookbook. Graph the results. PE, P

Vocational Education
- Prepare some of your favorite recipes to share with the class. PE, P

Reflections

Basic understanding of the concept of numbers begins with counting, set theory, and one-to-one correspondence proceeding to rational, real, and complex numbers. Young students must understand the relative size of all numbers, especially those which are very large or very small. Older students must understand the part-whole relationships in rational numbers. Finally, all students must eventually understand the relationship among whole numbers, integers, rational numbers, real numbers, and complex numbers.

Recent studies suggest that not only must students be schooled in an understanding of number concepts, but they must also develop an attitude of familiarity and comfort with the concepts. A proven strategy for instilling positive attitudes and comfort about mathematics is the use of cooperative learning groups in the classroom. These groups focus their energies on open-ended problem solving with the emphasis on the strategies used to solve the problems, not just finding the answers.

Source: National Council of Teachers of Mathematics (NCTM), Curriculum and Evaluation Standards

Core Concept: Number

Sample Middle School Activities

- Simulate the application of square roots/irrational numbers by constructing line segments (using Pythagorean Theorem) on geoboard or dot paper. P
- Represent integers using colored chips. Represent positive integers with one color and negative integers with another color. PE
- Explain the placement of the decimal point in the product of 2 decimal numbers using decimal squares (base 10 blocks). (e.g., 0.2 x 0.3 = 2/10 x 3/10 = 6/100 = 0.06) OE, P
- Communicate a play-by-play description of a football game using a number line and integers. P
- Build all the possible rectangular arrays using 1 sq. unit, 2 sq. units, and so on. Find a relationship between prime, composite, and square numbers with the arrays. PE, P
- Explain how to solve a mathematical problem using audio or video media. PE, P
- Search periodicals using CD-ROM to locate uses of scientific notation. PE

Applications Across the Curriculum

Language Arts

- Write poems or limericks about math topics or ideas or geometric figures: "There was a math figure named Circle..." P
- Create word problems based on characters, situations, and settings from children's literature . OE

Science

- Estimate and then calculate the number of stairsteps needed to reach from the earth to the moon. P

Social Studies

- Graph relevant statistics of different countries such as population, natural resources, wealth, and standard of living. Draw conclusions. OE, P

Arts and Humanities

- Select one pair of complementary colors. Let warm color represent positive integers and cool represent negative integers. Mix positive and negative in equal parts to create a neutral (grey). Make a painting using only those two complements. (Warm colors advance, cool colors recede and neutrals remain in the middle ground.) PE, OE, P

Practical Living

- Compute personal expenditures for several months and then compute the average per month. PE
- Analyze and compare two different size bottles of aspirin as to number of doses and unit prices. Compute unit price of each dose contained in each container. P

Vocational Education

- Bring in telephone and utility bills. Find cost per minute of long distance calls, and per kilowatt-hour of electricity from utility bills. PE, P

Core Concept: Number

Sample High School Activities

- Graph $Y=1/(x^2+1)$ exponent on a graphing calculator. Set the range for x from -5 to 5 and the y from -1 to 2. Translate graph from calculator to grid paper. Count the number of the rectangles under the curve to estimate the area under the curve. OE
- Represent complex numbers on polar graph paper and relate them to blips on a radar screen. PE, P
- Develop strategies for estimating large populations (e.g., animals, people, grains of sand). Use sampling techniques. PE, OE, P
- Explain to a classmate the meaning of 3^0. OE, P
- Find the pattern of the decimal equivalents for all fractions with a denominator of 9. Then extend to include fractions with a denominator of 99. Present findings using computer graphics. OE, P
- Represent, using models, a number as a fraction, decimal, and percent (e.g., 15/100 = 3/20, .15, 15%). Identify situations where one representation is more appropriate than another. PE, OE

Applications Across the Curriculum

Language Arts
- Design a poster for recruiting students into higher level mathematics courses. PE, OE

Science
- Use Avogadro's number to determine the depth of a layer of marshmellows spread evenly across the United States. Identify factors which would influence a variation in the depth. PE, OE, P
- Use fractals in the creation of a topographic map. PE, OE, P

Social Studies
- Make predictions about the population, natural resources, wealth, and standard of living of different countries for the year 2025. PE, OE, P

Arts and Humanities
- Create a painting using a limited color scheme that has asymmetrical balance. Write an equation that demonstrates your solution. PE

Practical Living
- Complete a comparative study of the distance runners at the local high school. Do one study in miles, the other in meters. PE, P
- Display information on cardiovascular disease and lifestyle behavior so that it is readily understood. PE, OE, P

Vocational Education
- Estimate and determine the open mesh in a 60xx screen for screen printing. P

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.8: Students understand various mathematical procedures and use them appropriately and accurately.

Learning Links: Spreadsheets / Advertisements / Shopping / Computer Programming / Timeshare / Travel Plans / Networks / Flowcharts / Ecology / Pay Schedules / Income Tax / Universal Law / Scientific Principles / Law

Related Concepts: Mathematical Expression / Mental Mathematics / Technology / Logic / Estimation / Proportion / Computational Algorithms / Development of Algebraic Processes / Proof / Order of Operations

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Explore logical thinking strategies.
- Explore the use of open sentences to express real-life situations.
- Investigate and discover a variety of mental computation and estimation techniques.
- Translate concrete and pictorial problem situations into mathematical language and symbols, and vice versa.
- Investigate relationships through the use of patterns to construct operations and algorithms.
- Manipulate objects to model and communicate operations in a rich variety of problems.

Middle School Demonstrators

- Apply and justify computational methods (calculator, paper/pencil, mental math, estimation, computer).
- Solve equations with concrete, pictorial, and abstract methods.
- Translate real-world proportional relationships into mathematical expressions and vice versa.
- Translate from concrete, pictorial, and verbal expressions to mathematical expressions and vice versa.
- Interpret and organize information for logical deductions.
- Use models and investigations to construct algorithms using rational numbers.

High School Demonstrators

- Validate mathematical assertions and judge the validity of real-world statements using deductive arguments.
- Make and test conjectures through investigations.
- Select and apply appropriate strategies (e.g., equations, inequalities, matrices, and networks) to solve problems.
- Use concrete, pictorial, and abstract models to develop and/or solve algebraic problems.
- Use concrete, pictorial, and abstract models to develop and/or generalize a procedure.
- Formulate examples and counterexamples.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Graphic Organizers**: Matrix • **Problem Solving**: Heuristics, Future Problem Solving, Research, Formulating Models • **Technology/Tools**: Manipulatives, Computers, Games, Calculators

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Work with local social services representatives to compile data and determine average number of homeless who are fed in the community and plan low-cost nutritious meals for them.
- Prepare income tax returns for senior citizens.
- Serve as interns in local projects with civil engineer.
- Survey a variety of white and blue collar workers to determine if and how mathematics is used in their vocations.

Core Concept: Mathematical Procedures

Sample Elementary Activities

- Use a storyboard to model the action in a number sentence. PE, OE, P
- Compare the strategies in computer software programs which address logical thinking (e.g., Gertrude's Puzzles, Moptown Parade, Iggy's Gnees, The Pond, or Gnees or Not Gnees). PE
- Use a ten-frame chart to show various strategies for adding 9+8 (e.g. shift to make 10, doubles + 1, neighbors). PE, OE
- Use a calculator with a constant function to explore counting and operational patterns. OE
- Show how to divide different groups of items such as 5 candy bars, 10 donuts, or 11 comic books among 4 students. PE
- Create algorithms for adding, subtracting, multiplying, and dividing whole numbers. OE, P

Applications Across the Curriculum

Language Arts
- Sort out the jumbled pieces in an action sequence and list them in order. PE
- Locate a poem or story that shows a mathematical sequence. OE

Science
- Determine, calculate, and demonstrate the mechanical advantage of a pulley system or inclined plane. PE, OE, P

Social Studies
- Investigate time zones throughout the world. Calculate current time in countries/cities in the daily news (e.g., London, Tokyo, New York). PE

Practical Living
- Keep a log documenting regular participation in a physical fitness activity and graph time spent on your fitness program (e.g., jogging, bicycling, etc.). PE, OE, P
- Estimate and verify the total amount of trash in the school for a day. Graph results. PE, OE, P

Vocational Education
- Compose real-world problems using information from the newspaper or almanac (e.g., "What are the factors that affect milk prices?"). OE
- Compare the price of a cafeteria lunch versus a brown-bag lunch. Consider additional factors. PE, OE, P

Core Concept: Mathematical Procedures

Sample Middle School Activities

- Write a set of directions for a younger student, explaining how to add two fractions (e.g., 2/3 + 1/4). Use computer graphics to draw pictures or diagrams in the explanation. PE, OE, P
- Tell a story based on a selected picture that generates a multi-step mathematical problem. OE
- Investigate the Fibonacci sequence as applied to nature (e.g., seeds in a sunflower, whorls on a pineapple, birth of rabbits). Present findings using multimedia. PE, OE, P
- Verify the theorem: The sum of the angles of a triangle is 180 degrees. Cut a triangle out of a piece of paper. Tear off the corners of the triangle and assemble them in a straight angle. Or, fold a paper triangle so that the vertices meet at a point. P
- Compare the answers of a multi-operational exercise using paper/pencil and various brands of calculators. Determine the necessity for order of operations (e.g., 2+3x5 on some calculators equals 25, rather than the correct answer of 17). PE, OE, P

Applications Across the Curriculum

Variations on a theme: Commerce

Language Arts
- Use ads from newspapers to figure out the savings on sale items. Compare similar products and justify the selection of the best buy. OE, P

Science
- Estimate the cost of gasoline for the average driver over a one-year period. Reevaluate estimation if there were an additional 10 cents increase per gallon. Discuss impact of increase on a fixed salary. OE, P

Social Studies
- Track the change in the cost of a single item over an extended period. Calculate the cost of the item in a foreign currency using the current rate of exchange. OE

Arts and Humanities
- Trace the value of a work of art from the time it was created through each sale. OE

Practical Living
- Calculate the cost of smoking a pack of cigarettes a day for one week, one month, and one year. OE

Vocational Education
- Establish and maintain a classroom bank. PE

Reflections

Mathematical procedures are routines or processes that have predictable results. Computational methods, use of terms and formulas, and noncomputational processes, such as geometric construction, measuring, solving equations, and transformations are all included within mathematical procedure.

Emphasis of instruction on procedures should be on investigation and modeling using manipulatives to construct meaning. Students should build connections among concrete representations, pictorial representations and symbols, before practicing procedures or searching for patterns within the symbol system. They should eventually be able to extend or modify familiar procedures or algorithms and generate new ones. It is assumed that all students have access to calculators and computers as tools for all experiences with procedures.

As students apply mathematics, they will have to decide which algorithms or procedure to use, the sequence in which to perform them, and how to verify that they give correct answers. They also must understand concepts underlying a procedure and the logic that justifies it. Reflecting on how and why procedures work as they do leads to an appreciation of the nature and role of procedures in mathematics.

Sources: National Council of Teachers of Mathematics (NCTM), Curriculum and Evaluation Standards
James Hiebert, "The Role of Routine Procedures in the Development of Mathematical Competence,"
1990 NCTM Yearbook, Teaching and Learning Mathematics in the 1990s

Core Concept: Mathematical Procedures

Sample High School Activities

- Explain the appropriate strategy to determine how many ways there are to travel among three points in a city using a series of one-way streets. Also consider the number of ways to travel from one point to another using one stopover. Use graph theory and matrices. P
- Obtain data of beginning and ending inventory from a local department store for a month including profit and sales commission. Use matrix operations to determine the number of items sold, profits, and commissions earned. Display data using spreadsheets. PE, P
- Solve an algebraic equation using algebra tiles, pictures of tiles, progressing to algebraic symbolism. PE
- Analyze advertisements for "if-then" statements embedded within them. Present findings using multimedia. PE, P
- Investigate perimeters of various rectangles with area of 24 square cm using models and drawings. Generalize to answer such problems as "Is there a rectangle of minimum perimeter with specified area?" Give dimensions. OE, P
- Design an algorithm to solve a difficult equation by using approximations. OE, P
- Design a method to approximate the area between two curves. OE, P

Applications Across the Curriculum

Language Arts
- Solve word problems by ordering the sequence of steps needed to complete the problem. Create a flowchart to match the steps. OE
- Create a database of words that have double meanings, one specific to mathematics and the other in another area (e.g., root, square). PE, P

Science
- Using a spreadsheet which incorporates birth, death, immigration, and emigration rates, predict the population of the United States at five year intervals over the next 25 years. PE, P
- Design an experiment to investigate a scientific principle such as Boyle's Law. PE, OE, P

Social Studies
- Investigate insurance actuarial charts to determine how insurance rates in the United States are established. Research the same information in another country. PE, P

Arts and Humanities
- Cut a matte of given dimensions for a picture. PE

Practical Living
- Research the incidence of HIV infection in United States population. Choose a factor (e.g., age, place of residence, number of partners) and calculate the risk of infection. OE, P

Vocational Education
- Prepare a spreadsheet comparing grocery brands for price, nutritional value, and convenience. PE
- Calculate cost of setting up a medical, dental, or other health care practice, including malpractice insurance and other costs. OE

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.9: Students understand space and dimensionality concepts and use them appropriately and accurately.

Learning Links: Sonar / Quilting / Cartography / Interior Design / Archaeology / Architecture / Computer Graphics / Graphic Design / Perspective / Auto-CAD / Clothing Design / Radar/Air Traffic Control / Fractals / Solar Systems / Dance / Topographic Maps / Molecular Models

Related Concepts: Regular and Irregular Figures in Various Dimensions / Coordinate Systems / Geometry / Congruence / Symmetry / Spatial Visualization / Spatial Representation / Similarity / Orientator / Vectors / Fractals

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Describe relationships among points, lines, segments, and angles.
- Explore symmetry, translations (slides), reflections (flips), and rotations (turns).
- Translate 3-dimensional objects to 2-dimensional drawings and vice versa.
- Investigate and predict the results of combining, subdividing, and changing shapes.
- Extend and create geometric patterns using concrete and pictorial models and recognize their use in the real world.
- Explore, identify, and classify similar plane and solid figures in various orientations.
- Describe, model, draw, sort, classify, and compare shapes.
- Demonstrate the spatial relationship of two objects (e.g., inside/outside, between).

Middle School Demonstrators

- Visualize different representations of 2 and 3-dimensional geometric figures.
- Explore, describe, and draw transformations.
- Investigate symmetry, similarity, and congruence using concrete models and drawing.
- Use a coordinate system to define and locate position.
- Use attributes to classify and analyze regular and irregular figures in 2 and 3 dimensions.

High School Demonstrators

- Verify conjectures about geometric objects using deduction (van Hiele Level 3).
- Explore and investigate the dimensionality of fractal objects.
- Compare, contrast, and translate among synthetic, coordinate, and transformational geometry.
- Apply transformations and vectors to solve problems and represent physical phenomena.
- Represent and solve problem situations with geometric models and properties.
- Apply congruence and similarity relationships in real-world situations.
- Interpret and draw 3-dimensional figures.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Inquiry, Creative Problem Solving, Future Problem Solving, Formulating Models • **Technology/Tools**: Computers, Manipulatives, Multimedia, Video Production

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section

Ideas for Incorporating Community Resources:

- Visit the geological survey department in your community and observe how maps are made.
- Do a community field study led by a local architect/construction worker/carpenter. Identify geometric properties and shapes used in the construction of buildings.
- Invite a local quilt maker to discuss repetition of patterns. Create class designs.

Core Concept: Space and Dimensionality

Sample Elementary Activities

- Build 3-dimensional shapes using toothpicks and gum drops. Discuss the relationship between the line segments and angles. PE, P
- Fold paper cutouts of various shapes (e.g. geometric shapes, leaves, snowflakes) to discover lines of symmetry. PE
- Construct a building with cubes. Then draw the building from all views (front, top, back, right side, and left side) on graph paper. PE, P
- Create a large square using a geoboard. Subdivide the square into as many squares as possible and record the number of squares. PE
- Construct a regular or irregular polygon on a geoboard and let another student construct the congruent shape in a slide (translation), turn (rotation), or flip (reflection) on his/her geoboard. Extend to movements made by characters on Nintendo games (Super Mario Brothers, Tetris). PE, P
- Create a repeating pattern with pattern blocks to cover an area such as quilt square, wrapping paper, or wallpaper. PE
- Make as many shapes as possible with 2 tangram pieces, 3 pieces, 4 pieces, and up to 7 pieces. PE
- Explore the properties of a planar shape using measuring instruments and list as many as you can. PE, OE

Applications Across the Curriculum

Language Arts

- Describe the rotation of an object. OE, P
- Tell a story about what life might be like if there were only two dimensions. OE, P

Science

- Construct a scale model of an organism. PE
- Build or draw a model of the entire shell of an animal after observing a shell fragment. OE

Social Studies

- Find examples of familiar geometric shapes in the built/physical environment. Create a histogram showing the frequency in which shapes occur. PE, OE

Arts and Humanities

- Use triangle pieces to construct a design with a repeating pattern. Use markers to find new triangles created by overlapping. PE, OE

Practical Living

- Construct environmental mobiles using geometric shapes to depict recyclable items, conservation practices, and pollution control. PE

Vocational Education

- Rearrange furniture in a playhouse to be used by different numbers of children. PE
- Create a floor design with parquet blocks. PE

Core Concept: Space and Dimensionality

Sample Middle School Activities

- Construct models of the five platonic solids and investigate relationships among the numbers of edges, faces, and vertices. PE, P
- Draw 2-dimensional top, front, and side views to represent a 3-dimensional object. Reverse the process to draw a 3-dimensional representation based on top, side, and front views. Use isometric dot paper. PE, P
- Draw or build a 2 or 3-dimensional model using oral or written instructions provided by another student. OE
- Work in cooperative groups with school cameras to take a series of photographs as the photographer rotates 360°. Shuffle photos. Have other groups reassemble photos in order and locate position of photographer. PE, P
- Draw a portion of a map on graph paper, locate two points, X and Y, and write a set of directions from Point X to Point Y. PE, P
- Build a simple kaleidoscope to show rotations and reflections. PE, P
- Draw a checkerboard from both 1- and 2-point perspective. PE, P
- Design a tile floor or quilt using simple tessellations. PE, P
- Show that lines are parallel by synthetic geometry (congruent alternate interior angles) and coordinate geometry (equal slopes). Write a comparison of the two methods. OE, P

Applications Across the Curriculum

Language Arts
- Keep a "geometry journal." Cut out interesting shapes and designs and list places they might be found in the real world. P

Science
- Compare and contrast geometric shapes of crystal forms grown in the classroom such as salt, alum, and sugar. PE, P

Social Studies
- Construct a model of an invention which would make a positive contribution to the American economy. PE, OE, P
- Develop a variety of maps depicting the school grounds (e.g., political, 3-dimensional relief map). PE, P

Arts and Humanities
- Draw your school building using 2-point perspective. PE, P

Practical Living
- Design a student activity area to best utilize existing areas. OE, P
- Enlarge a diagram of the body system using a grid method (physical wellness). OE

Vocational Education
- Draw a topographic map of a sloping area. PE, P
- Use a computer graphics program to design a brochure or invitation. PE, P

Core Concept: Space and Dimensionality

Sample High School Activities

- Estimate the height of the school flagpole using similar triangles, the height of a student, and relative lengths of shadows. PE
- Use vector analysis to determine the effect of wind shear on an airplane's actual track over ground. OE, P
- Design a computer program to draw a fractal. Use design on a T-shirt. PE, P
- Construct an Escher-type tessellation. PE
- Build a prism using cubes and find the surface area. Rearrange the same set of cubes into another shape and find the surface area. Discuss reasons why one shape could be more economical to build than another. PE
- Draw a coordinate system on a parking lot or football field; assign all students a different x value; students stand along the x-axis, and teacher calls out an equation in y-intercept form; students walk to y value to represent the graph. PE

Applications Across the Curriculum

Variations on a theme: Sculpture

Language Arts
- Describe a famous piece of statuary in terms of space and dimensionality. PE, OE, P

Science
- Design a packaging system to transport a particularly fragile sculpture. PE, P

Social Studies
- Trace the historical development of representations of the human form in sculpture with regard to size and proportion. P

Arts and Humanities
- Create a sculpture from a 2-dimensional subject. PE, P

Practical Living
- Design a display for a variety of sculptures. PE, P

Vocational Education
- Design a sculpture garden. PE

Reflections

Students who put a jigsaw puzzle together with ease, follow the drawing for the bicycle assembly, create three-dimensional models in geometry class, and read a road map without turning it upside down, are the students who are adept in the visual/spatial intelligence, understand dimension, and enjoy solid geometry. Yet, all students need to develop these skills in space and dimensionality if they are to be grounded in such practical arenas as interior design, dance, graphic arts, and architecture.

This area of mathematics helps students make the transition from abstract to concrete. Through investigative techniques that integrate art, design, and computer technology, students can apply the inert knowledge of the textbook to practical, real-life situations.

There are unending opportunities to incorporate the concepts of space and dimension into motivating and meaningful classroom projects. This planning is facilitated when an interdisciplinary team of experts lends insight into relevant learning experiences.

Sources: British Columbia Ministry of Education, Vocational Education/Integrated Learning
National Council of Teachers of Mathematics, Curriculum and Evaluation Standards

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.10: Students understand measurement concepts and use measurement appropriately and accurately.

Learning Links: Biorhythms / Circular Motion / Sound Waves / Scale Drawing / Light / Recipes / Sewing / Electricity / Drafting / Unit Pricing / Construction / Sports / Meteorology / Latitude and Longitude / Seismograph

Related Concepts: Maximum/Minimum / Trigonometry / Perimeter / Nonstandard Units / Area / Mass / Time / Metric/ Customary Units / Volume / Angle / Money / Vectors / Dimensions / Weight / Rate / Temperature / Area Bounded by a Curve

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Make estimates and measurements in solving problems using appropriate tools and units.
- Use nonstandard and standard units of measure.
- Develop concepts of length, capacity, weight, mass, area, perimeter, volume, time, temperature, angle, circumference, and money through use of manipulatives.
- Compare and order mass, length, area, and volume.
- Conserve mass, length, area, and volume.

Middle School Demonstrators

- Develop, through investigation, the formulas for perimeter, area, and volume.
- Determine the area of irregular shapes by subdivision using manipulatives.
- Extend the concepts of length, area, volume, mass, weight, capacity, time, angle, perimeter, money, circumference, and temperature using measurement tools and models.

High School Demonstrators

- Investigate the concepts of rates, energy, and other derived and indirect measurements.
- Explore periodic real world phenomena.
- Apply trigonometry to real world problems.
- Determine surface areas and volumes of solids in solving nonroutine real world problems.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Community-Based Instruction**: Field Studies, Mentoring, Service Learning • **Problem Solving**: Brainstorming, Inquiry, Formulating Models, Future Problem Solving, Research • **Technology/Tools**: Manipulatives, Computers, Video Production

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Interview building contractors to explain measurement as it applies to construction and cost.
- Observe and record the ways measurement is used by employees during a visit to a medical laboratory (e.g., T-waves on an EKG, or number of blood cells on a blood smear).
- Visit an amusement park to investigate application of laws of physics on various rides.

Core Concept: Measurement

Sample Elementary Activities

- Plan and plant a class garden on school grounds. Use seed charts to determine distance between plants. Plot temperature and rainfall each day. PE, P
- Measure a tabletop perimeter to the nearest decimeter and centimeter. Evaluate which measurement is more appropriate. PE, OE
- Estimate the number of large pizza boxes required to cover the playground, and determine a method to evaluate your estimate. PE, OE, P
- Order a group of objects by estimation of their weights. Use a balance scale to determine the actual order and compare predictions. PE
- Pour the same amount of liquid into two identical containers. Pour the contents of one container into a third container of different shape/size. Determine whether the containers hold equal amounts (conservation activity). PE

Applications Across the Curriculum

Variations on a theme: Sports

Language Arts
- Write and illustrate a book about how measurement is important in your favorite sport. PE, P

Science
- Prepare graphs to compare the areas of various sports fields relative to the number of players. PE, OE, P

Social Studies
- Investigate the influence of geography of a region on the development of sports playing fields. OE, P

Arts and Humanities
- Design a one-size T-shirt for your classmates to wear as a sports uniform. Determine if the average size is appropriate for all. Create a logo for the uniform. OE, P

Practical Living
- Develop a school-wide Olympics in which all students will participate. PE

Vocational Education
- Create a database to display information about sports injuries in children ages 5-18. Include gender, age, and sport. Show frequencies and correlations using computer-generated graphics. OE, P

Reflections

Measuring requires not only skill in using various measurement tools, but also the conceptual understanding of establishing and using a standard to analyze information. Currency is set on a standard, for example, as is weight, volume, area, length, and temperature.

By introducing traditionally accepted standards such as metric, and helping students invent their own set of standards, skillful use of the measurement tools is undergirded with in-depth understanding of why standards are needed and how they work.

As students become skilled in the use of the various measurement tools, problem-based learning situations can focus attention on how to select the most appropriate measuring device and how to best analyze the information. Because communication skills relate to other skills of research and reporting, teachers can integrate appropriate measuring activities and subsequent discussions about measurement into many relevant areas of classroom investigation.

Source: National Council of Teachers of Mathematics (NCTM), Curriculum and Evaluation Standards

Core Concept: Measurement

Sample Middle School Activities

- Select a shape to represent one unit of area measurement. Use the unit to find the area of irregular figures (e.g., geoboards, grid paper, dot paper). PE, OE
- Demonstrate experimentally the volume of a cone compared to the volume of a cylinder with the same base and height. PE, P
- Use and explain three different methods for approximating the area of an irregular shaped playground. PE, OE, P
- Use similar figures or the Pythagorean Theorem to make indirect measurements (e.g., shadows, pinhole cameras). P
- Investigate the average number of kernels on an ear of corn. Compare findings with number of kernels found in the average serving of canned corn/popped corn. PE, OE, P
- Use a trundle wheel to investigate circumference and its relationship to π by connecting one end of a string to a stake in the center and the other end to the axle support of the wheel. Compare the circumference of the circular path to the radius using various lengths of string. Record and explain results. PE, P

Applications Across the Curriculum

Language Arts
- Write an explanation to this question, "If you measured an object with five different methods and got five different answers, how would you decide which answer is correct?" OE

Science
- Calculate the time it takes for light to reach the earth from the sun and the next nearest star given the distances involved. OE
- Calculate the average density of several types of stones. OE

Social Studies
- Pretend it is the mid-1800s. Research and share how measurement was important to the following professions: sailor, physician, explorer, and farmer. OE
- Research standards of measurement such as clothing and shoe sizes. What differences would you encounter if there were not "standards"? OE

Arts and Humanities
- Find the number of ways a piece of paper can be divided into two equal areas. OE

Practical Living
- Make a scale drawing of a classroom which depicts energy conservation measures. PE
- Prepare a recipe that includes using a variety of measuring techniques (e.g., liquid, dry, volume, length). PE

Vocational Education
- Estimate actual dimensions of a house given a 3-dimensional model with 1 inch representing 1 foot. Create a scale drawing. PE, OE, P

Core Concept: Measurement

Sample High School Activities

- Measure the length of the parking lot at your school. Use a stopwatch to measure the time it takes to walk this distance. Compute walking speed . PE
- Determine the maximum volume of a container formed by cutting squares from the corners of grid paper and folding to make a box. Use models, charts, and graphs of the function to determine the maximum measurement. PE, P
- Estimate the area between two curves. Use a graphing calculator to adjust your estimate. OE, P
- Investigate the relationship between the observation of a flash of lightening and a clap of thunder. Use the information to determine the location of the greatest electrical activity. PE, OE, P

Applications Across the Curriculum

Language Arts

- Write and illustrate a book for children about a character who had no measuring tools. P

Science

- Use a laser to generate data to mathematically calculate the distance a student moves a wall using hand pressure. PE
- Develop an activity, to be used in a middle school classroom, to teach the concept of parallax. PE, OE, P

Social Studies

- Prepare a map of school grounds using an accurate measurement key. PE, P

Arts and Humanities

- Create a sculpture of a human head (self-portrait) using tools (calipers) to obtain and transcribe actual measurements. PE, OE, P

Practical Living

- Calculate and record the effect of different types of exercise on the heart rate. PE, P
- Determine the amount and cost of carpet and wallpaper needed to decorate an office. PE, OE, P

Vocational Education

- Measure the P-waves, QRS complexes, and T-waves on an EKG. Analyze the results. PE, OE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.11: Students understand mathematical change concepts and use them appropriately and accurately.

Learning Links: Nature / Evolution / Chaos / Topology / Human Development / Mutations / Chemical Reactions / Geopolitical / Fractals / Rock Formations / Migration

Related Concepts: Transformations / Trigonometric Functions / Continuous vs. Discrete / Algebraic Representations/ Variables / Limit / Sequences / Functions / Matrix Representations / Series / Patterns

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use variables, represented by manipulatives, to express relationships involving change.
- Explore the concepts of unknown quantities and effects of change (functions).
- Extend and create patterns and generalize structures from patterns (e.g., square numbers, geometric patterns, patterns in nature) in number sequences.
- Observe patterns of change (e.g., seasons, height, weather) in everyday life and discuss causes and effects.

Middle School Demonstrators

- Explore functions that can be derived from physical models, data, and other mathematical representations.
- Investigate patterns in number sequences and relate to real world experiences.
- Represent patterns in several ways (e.g., graphs, ordered pairs, verbal statements, algebraic rules).

High School Demonstrators

- Investigate the properties of various types of functions, (e.g., linear, quadratic, logarithmic, trigonometric, etc.).
- Determine appropriate model to represent change in data (i.e., discrete or continuous).
- Use curve fitting to predict change.
- Explain how a change in one quantity affects a change in another.
- Model a variety of problem situations with similar functions.
- Analyze the effects of parametric changes on graphs.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Mentoring • **Continuous Progress Assessment**: Observation, Performance Events, Portfolio Development • **Graphic Organizers**: Graphic Representations, Flowchart • **Problem Solving**: Inquiry, Questioning, Case Studies, Creative Problem Solving, Future Problem Solving, Formulating Models, Simulations • **Technology/Tools**: Manipulatives, Computers, Multimedia

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Contact public agencies for data specific to the community (e.g., water company for information on water pressure and flow rate, U.S. Census Bureau for demographic data).
- Take a field trip to the local automobile dealership and have a salesperson explain how the NADA (Blue Book) standards are used to determine the price of used cars.
- Survey businesses to discover how future sales/services are projected from current sales figures and how that affects future staffing.

Core Concept: Change

Sample Elementary Activities

- Use a working set of interlocking gears with 24, 12, 8, and 4 teeth, and predict the number of revolutions for each. Use the computer program "Gears" for a follow-up program. PE, P
- Read "Caps for Sale." Use a simple spreadsheet program to calculate money received if a variable number of caps are sold at $.50 a cap. OE
- Use a calculator with a constant to play "What's My Rule." Enter "+4=" to store. Press "4 =" (the number 8 will show). Give to partner, who presses a number and "=" to determine the rule (the number that is stored). OE
- Place one bean plant in sunlight, and another bean plant of the same size in a closet. After one week, measure both, record the changes and discuss the reasons for any differences. PE, OE
- Build 2, 3, and 5 span bridges using red and yellow Cuisenaire rods (1 yellow and 2 end red rods = 1 span). Explain how many red and yellow rods you would use to make a 20 span bridge. Develop a rule for building bridges. PE, OE, P
- Describe patterns found on addition, subtraction, multiplication, and division tables. OE
- Describe patterns on a hundreds chart. OE

Applications Across the Curriculum

Language Arts
- Write a recipe book, including measurements, for enlarging or reducing the recipes. P

Science
- Create a collage time line of science-related toys over a period of fifty years. P
- Construct flip-books of the life cycle of a plant (bean) or animal (butterfly). OE

Social Studies
- Select a popular vacation spot. Predict seasonal or event related population changes. Gather data that supports or rejects the prediction. Present findings using graphic representatives. OE, P

Arts and Humanities
- Make a value scale using black and white tempera paint. Record the value changes by amount of white paint added. OE, P

Practical Living
- Record height and weight of students over time. Do a chart comparison from the beginning, middle, and end of the year. P

Vocational Education
- Calculate the number of cups of ice required to meet the Recommended Daily Allowance (RDA) of water. P

Core Concept: Change

Sample Middle School Activities

- Discuss the effect of coordinate changes on the shape of coordinate plot pictures (e.g., double both x and y coordinates and plot a new picture, double the x values and plot a new picture). PE, P
- Show graphically how overhead costs and expenditures for advertising affect profits of a pizza parlor. PE, OE
- Investigate relationships between height and length of radius bone of several students in the class. Develop a general rule. Suppose you are an anthropologist and have found a radius bone of 25 cm. long. Predict the height of the person. PE, P
- Use the school records from 20 and 10 years ago to determine the most popular first names of boys and girls. Survey the current school population to find the current top ten. Based on past trends, predict the ten most popular names for boys and for girls in the year 2000. P

Applications Across the Curriculum

Variations on a theme: Pollution and the Environment

Language Arts
- Research waste management control practices for public schools. Present your findings to the school council, school board or other decision-making body. PE, OE, P

Science
- Track the amount of paper or food-scrap waste in the school over specific periods of time. Graph the results. P

Social Studies
- As a group project, design a campaign to address waste management issues and convince classmates, teachers, administrators and staff to become involved with a waste reduction program at the school. PE, P

Arts and Humanities
- Inform people through a visual medium about the waste management compaign project and encourage continued involvement. PE

Practical Living
- Prepare a set of suggestions for reducing the amount of food-scraps and packaging waste. Graph results of the reduction in waste. OE, P

Vocational Education
- Investigate and present data showing the growth in waste management careers over the last decade. PE, P

Reflections

Students need opportunities to study change in time, space, and events. The mathematics of change asks students to argue their understanding. This may require a model that allows for both interpolation and extrapolation. Such a demonstration of understanding should encourage reasoning in the area of "what might be" and "what if."

Using particular patterns in mathematics, students learn how change affects patterns or functions. In arithmetic, functions appear as operations on numbers; in algebra, as relationships between variables; in geometry, as relationships between points and their images under motions; in probability, as relationships between events and their likelihoods. Students need ways to discover functional relationships between two variables by observing a phenomenon and by gathering and plotting observational data. They can then represent the changes with graphs, algebraic equations, or verbal statements. Although change is introduced in mathematics and science areas, it is embedded in studies of history, literature, cultural arts, and technology.

Source: National Council of Teachers of Mathematics (NCTM), Curriculum and Evaluation Standards

Core Concept: Change

Sample High School Activities

- Collect data on a particular car model from the NADA book (Blue Book). Plot the year (independent variable) with the price (dependent variable). Look for patterns. Compare different models. PE, P
- Investigate and compare graphs of families of functions using a graphing calculator. PE, P
- Discuss and act out a story based on interpretation of a graph of a traveling vehicle. PE, OE
- Use technology to graph the following situation: A ball is dropped from a height of 10 meters and loses 30% of its height (y) on each successive bounce (x). The maximum height on each bounce is given by $y=10(0.7)x$ where x must be a positive integer. Compare this discrete graph to a continuous graph of the same equation where the domain is the set of reals. Discuss why a discrete graph (rather than a continuous graph) is the appropriate representation of this situation. OE, P
- Explain how changing the parameters of a function affects the graph of a function, e.g., how does $f(x)$ differ from $f(x+a)$ and from $f(bx)$. OE
- Create a large right triangle on the floor using a large loop of string with student at each vertex. Investigate sine and cosine relationships by changing the angle at the center (maintain constant length of the hypotenuse). Follow up with use of scientific calculator. PE

Applications Across the Curriculum

Language Arts
- Write a valid argument to convince someone that adding the same number of points to each student's test score will increase the average score by the same amount. OE, P

Science
- Collect and graph pressure and volume data. Develop an equation relating pressure to volume. PE, OE, P

Social Studies
- Research the changes in the types and numbers of crime occurring since 1800. Draw conclusions as to why changes have occurred and make predictions for changes in the future. OE, P

Arts and Humanities
- Write an essay describing how color changes and relationships influence color clarity, setting, and mood. PE, OE, P
- Choose a well known artist's work (e.g., Starry Night, Whistler's Mother). Reproduce the painting using opposite colors from the artist. P

Practical Living
- Calculate the average number of times people change jobs in the United States. Infer the consequences for your education as you prepare for a career. P

Vocational Education
- Contrast the root-growth rate of plants that have a 5.0 pH and those that have a 7.0 pH. PE, P
- Set up a graphical representation of an insurance actuarial table using spreadsheet software. PE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.12:

Students understand mathematical structure concepts including the properties and logic of various mathematical systems.

Learning Links: Anatomy / Programming / Cause-and-Effect / Outline/Research / Mayan/Incan/Aztec/Egyptian Cultures / DNA / Binary Systems / Political Systems / Cryptology / Government

Related Concepts: Logic / Systems of Equations / Discrete Structures / Number Systems / Order Relations / Inequalities / Patterns / Matrices / Axiomatic Systems / Properties (Fields)

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Compare and contrast the structural characteristics of varying numeration systems (e.g., other bases, Roman numerals, cuneiform).
- Explore logical thinking (i.e., analogies and syllogisms).
- Explore the properties of relations, including order (i.e., <, >, familial relationships, longer than).
- Sort objects and compare attributes.

Middle School Demonstrators

- Use and compare various number systems.
- Communicate (by modeling, verbal/written explanation, and graphing on a number line) an understanding of order relations and inequalities.
- Apply field properties to solve problems and equations (e.g., pencil/paper and mentally).
- Use order of operations with rational numbers.

High School Demonstrators

- Use deduction in an axiomatic system.
- Analyze similarities in various mathematical systems.
- Communicate the logic of algebraic procedures.
- Analyze the structural characteristics of the real number system and various subsystems.
- Investigate and solve optimization problems.

Sample Teaching/Assessment Strategies:

Graphic Organizers: Compare/Contrast Structures, Mapping, Matrix • **Problem Solving**: Heuristics, Inquiry, Debate, Oral History • **Technology/Tools**: Calculators, Computers, Games, Manipulatives

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a variety of ethnic representatives in the community to bring the class samples of their number systems.
- Examine, with a local architect, buildings in the community that illustrate the "Golden Rectangle."
- Interview police, attorneys, and physicians on the effect of using DNA for identification in criminal cases.

Core Concept: Mathematical Structure

Sample Elementary Activities

- Study the culture of Egypt; describe and compare the use of Egyptian and Hindu-Arabic (ours) numerals. P
- Solve and create analogies:
  - a. inch: yard:: centimeter: __METER__ ;
  - b. ball: circle:: __BOX__ : rectangle P
- Examine the Fibonacci numbers and find examples in nature (petals on a flower, birthrate of rabbits, spirals on a pine cone). OE, P
- Prepare a graphic organizer (web) of your family. In a cooperative group, each student assumes the role of a specified family member. Each student explains his/her relationship to other members of the group. OE, P
- Stand in hula hoops (Venn diagram) according to assigned attributes, (e.g., red shirts in one hula hoop, blue tennis shoes in another hoop). PE
- Discuss when you might need to sort into given classes or subclasses. OE

Applications Across the Curriculum

Language Arts
- Write directions to enter a mathematical expression into a calculator. PE, P

Science
- Determine the surface area of different leaf specimens by using grids or geoboards. Sequence the leaves based on the surface areas; graph the results. PE, OE, P

Socal Studies
- Develop a chart showing the relationship between the population of states and the number of votes in the electoral college. The chart should arrange states from largest to smallest in terms of population. OE

Arts and Humanities
- Photograph classmates to determine components of interesting pictures. OE, P

Practical Living
- Make a chart showing positions and responsibilities of players on a flag football team. OE

Vocational Education
- Conduct a food drive; sort collected food into food groups. Organize into nutritious meals. PE, OE

Core Concept: Mathematical Structure

Sample Middle School Activities

- Use models to compare the relative sizes of fractions and decimals (fraction bars, decimal factory, and/or decimal squares). OE
- Analyze problems to see how the field properties can simplify computations and practice using mental math strategies (e.g., 12(1/2 + 1/3) = 12x1/2 + 12x1/3 or 16+(84+59) = (16+84) + 59). OE
- Invent, develop, and explain a monetary system and put it into operation in the classroom. PE, PO
- Create a number puzzle that chains a starting number and ending number together using all four operations. OE, PE, P
- Illustrate a recent homework problem using a flowchart. PE

Applications Across the Curriculum

Language Arts
- Write a story to describe an algebraic equation. Use names of class members and familiar situations. OE, P

Science
- Compare the surface area available for photosynthesis on a variety of leaves and needles and make correlations with the total number leaves on the tree. PE, OE, P
- Determine the gene frequency of a trait in your classroom population. P

Social Studies
- Chart the passage of a bill through Congress. PE, OE, P

Arts and Humanities
- Use a formal structure to notate "Jingle Bells." PE, OE, P

Practical Living
- Use a computer program to chart the individual intake of minerals and vitamins for one day. Relate to the RDA (required daily allowance). OE, P

Vocational Education
- Compute the time it will take an accident victim to rebuild a given blood loss. OE, P

Core Concept: Mathematical Structure

Sample High School Activities

- Explain the error in an incorrect algebraic procedure (e.g., $(4x+2)/6 = (2x+2)/3$). OE, P
- Test the set of integers under the operation of addition and multiplication for the field postulates. P
- Use models to show the relationship between perimeter, area, and volume. Make a written record of your observations. P
- Investigate and design a plan for transporting 200 students from hotel to convention center if there are these constraints: There is only one limousine and one van; the limo costs $7.00 per trip, and it can make the one-way trip in five minutes and holds 6 people; the van cost 25 cents per person, makes the one-way trip in 20 minutes, and holds 10 people. OE, P
- Make tables for modular arithmetic or electric circuitry. Test each system for field properties. P

Applications Across the Curriculum

Variations on a theme: Genetics

Language Arts
- Produce a science fiction video of a simulated DNA experiment. PE, OE, P

Science
- Manipulate permutations of gene placement and predict the results using a computer simulation program. PE, OE, P

Social Studies
- Prepare a HyperCard stack of science fiction movies with a "genetics" theme. PE, OE, P

Arts and Humanities
- Review selected "genetics related" science fiction movies and create a flowchart showing their use of selected technology(s). OE, P

Practical Living
- Invite a geneticist to class to discuss computer applications in genetics research and counseling. OE

Vocational Education
- Document the genealogy chart of selected characteristics in animal breeding. P

Reflections

In the purest sense, students need a solid understanding of mathematical structures; a knowledge base that includes not only the procedures, operations, and calculations, but the reasoning that supports the various applications. Students may be able to count in the binary system, know the answer to an analogy, know a formula, or recognize symbolic language; however, it takes in-depth reasoning to understand how the binary system works in computer applications, to create a set of analogies, to understand the logic behind the formula, and to understand the functions of symbols in relation to each other.

The structure of mathematics is the foundation for logical reasoning in any number of life situations. Whether or not students are using the deductive thinking of a doctor, matching symptoms to a known disorder, or the inductive reasoning of a detective, trying to line up an assortment of seemingly unrelated clues into some pattern that points to the answer to the problem—in both cases, the student relies on the very principles that create the mathematical structure of the universe.

Teacher teams can provide opportunities for students to "see" connections within and between systems. It is a pretty good hint that mathematical structure is involved when students make statements like "this is just like..." or "this is nothing more than..."

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.13: **Students understand and appropriately use statistics and probability.**

Learning Links: Government/Politics / Genetics / Lottery / Census / Weather / Games/Fairness / Life Insurance / Quality Control / Polling / Trends / Stock Market / Natural Disasters / Marketing

Related Concepts: Data Analysis / Statistical Procedures / Modeling / Graphing / Measures of Central Tendency (including mean, median, mode) / Measures of Dispersion (including range and outliners) / Experimental Probability / Theoretical Probability / Simulation

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Elementary Demonstrators

- Make inferences and convincing arguments that are based on data analysis.
- Analyze data to determine the most appropriate way to organize data for display.
- Formulate and solve problems that involve probability and statistics.
- Construct, read, and interpret displays of data.
- Collect, organize, and describe data.

Middle School Demonstrators

- Analyze probabilities to make decisions involving real world situations.
- Determine probabilities by constructing sample space and conducting experiments.
- Make predictions and evaluate conclusions based on statistical analysis.
- Collect, display, analyze and interpret the data from a selected population.
- Determine the validity of the use of data.

High School Demonstrators

- Design and conduct an experiment/ simulation and interpret the results.
- Analyze sets of data using assumed normal curve distribution.
- Create and interpret discrete probability distributions.
- Determine and use experimental or theoretical probability to represent and solve problems involving uncertainty.
- Use curve fitting to predict from data.
- Use the appropriate measures of central tendency, dispersion, variability, and correlation to describe a set of data.
- Organize, display, and draw inferences from data and make statistical decisions.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies, Networking • **Graphic Organizers**: Time Line, Graphic Representations • **Problem Solving**: Brainstorming, Inquiry, Interviews, Research, Case Studies, Debate, Simulations • **Technology/Tools**: Manipulatives, Calculators, Telecommunications, Games

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Discuss with an insurance agent ways that insurance rates are determined.
- Invite a representative of the KY Dept. of Agriculture to discuss formulas for calculating grain futures.
- Conduct a field investigation of leaf arrangements on native trees (e.g., yellow poplar, elm, weeping willow) with a representative of the KY Division of Forestry to discover the relationship between the arrangements and the Fibonacci sequence.
- Visit the Kentucky Derby Museum at Churchill Downs for a workshop on probability and statistics.

Core Concept: Data

Sample Elementary Activities

- Count the number of raisins in a small box. Create a line graph using the class data. Use post-it notes to extend the line graph into a vertical bar graph. Discover the median, mode and range. Rearrange post-it notes to equalize the bars to discover the mean. Use a computer graphing program (e.g., "IBM: Time, Money, and Measurement) as a follow-up activity.) PE, OE, P
- Take a survey of favorite foods prepared in the school lunchroom. Graph the results and analyze the data. Use this analysis to approach the lunchroom manager in an effort to have the foods prepared more often. PE, P
- Collect data on eye color of students in the class. Analyze the data and prepare an appropriate graph of the part of the class with blue, brown, and hazel eyes on a circle graph; the number of students that have blue, brown and hazel eyes in a bar graph . Discuss the appropriate use of each type of graph. PE, OE, P
- Discuss differences in shoe styles. Use a graphing mat to physically graph types of shoes worn by students. Interpret and draw inferences. OE, P
- Given a mystery graph, describe a situation which the graph might represent. OE

Applications Across the Curriculum

Variations on a theme: Surveys: Food Preferences

Language Arts
- Design a survey to determine food preferences. OE

Science
- Generate charts and graphs based on the survey results showing food preferences. PE, P

Social Studies
- Conduct the survey for food preferences and compile the results. OE

Arts and Humanities
- Contact an elementary school with a different cultural heritage. Have them conduct the survey there and compare the results to those from your school. OE, P

Practical Living
- Correlate the data from the survey to show preferences by food groups. P

Vocational Education
- Compare the results of the food preference survey to the school menu. Make recommendations which match food service requirements to change the school menu. P

Reflections

Data collection, analysis, and application could be used as an example for the three-story intellect model. The first-story intellect is concerned with gathering data. Students then take unorganized data and impose an organization which moves them to the second-story intellect where data is processed. At this stage, students analyze the data and make sense of what information they have available. Specifically, in the second-story intellect, data are compared, contrasted, classified, and prioritized; analyzed for cause-and-effect relationships, biaes, assumptions, used to draw conclusions, and to make the implied inferences.

Students then use the third-story intellect, where the facts are applied in a number of ways. Specifically, analyzed data is used to predict trends, measure central tendencies, dispersion, variability, and correlations. Data, at this stage, is interpreted and the results are stated as findings. Implications of the findings reveal possible barriers or problem spots for which to plan and prepare.

Study of the future often lends itself to rigorous trend analysis and creative extrapolation of data. This could form the basis of an interdisciplinary unit.

Source: Fogarty & Opeka—Start Them Thinking

Core Concept: Data

Sample Middle School Activities

- Record the number of hours you spend sleeping, studying, watching TV, and attending school each day. Look for patterns in your lifestyle. Predict the number of hours you will spend doing one of these activities next week and convert to fractional parts of a week. Would the fractions be the same for every week of the year? Explain. OE, P
- Model mean, mode, and median by using cubes (e.g., take stacks of 1, 3, 3, 6, 7 cubes or any other workable amounts). The median is represented by the middle stack of 3 when the cube stacks are ordered low to high. The mode is also 3. To find the mean, move cubes until all stacks are the same height. Discover the algorithm for calculating the mean based on several cube experiences. PE, OE
- Conduct class or school surveys on topics of interest to students. Make graphs to represent data. Analyze the data by calculating the mean, median, mode, and range, using a frequency distribution when appropriate. PE
- Collect instances where statistics are used in advertising. Discuss cases of misuse of information. OE, P

Applications Across the Curriculum

Language Arts
- Graph how many words you can read in one minute, 5 minutes, and 15 minutes. Use this information to predict how many words you can read in 30 minutes, 60 minutes, and 120 minutes. What factors affect the outcome? PE, OE, P

Science
- Survey your community to determine the incidence of a particular disease. Predict the likelihood of contracting the disease (e.g., heart problems, tuberculosis) based on gender and age. PE, OE, P

Social Studies
- Research life expectancy rates in several countries. Research additional information about the countries which might contribute to life expectancy. OE, P
- Design an investigation to find 5 of the most littered places in the community. PE, OE, P

Arts andHumanities
- Establish a rubric or scoring guide to evaluate charts and graphs produced in math class or various newspaper graphs, such as those in USA Today. Use the elements and principles of design for criteria. OE, P

Practical Living
- Collect the data on the scores of a physical fitness test for a class. Determine how that class compares with the others in the school as well as comparison to state and national norms. PE, OE, P
- Survey, by grade level, areas in which students feel the most pressure to conform. Record the data and graph the results. PE, OE, P

Vocational Education
- Investigate the quality control program in a factory. Determine the percentage of products that meet the expected specifications over a product run. OE, P

Core Concept: Data

Sample High School Activities

- Simulate and analyze the following situation: Frosted Fun Flakes is including 1of 6 different toys in their cereal. Determine how many boxes one needs to collect all 6 toys. Use a six-sided die to simulate the boxes of cereal and their prizes. Use a computer to repeat the same problem with 10 different toys. PE
- Use box and whiskers, stem and leaf, bar graphs, circle graphs, line graphs, frequency tables, cumulative frequency tables, rank order listings, and scatter plots to represent data. Draw inferences from the graphs, including which form best communicates the data. OE, P
- Determine a line or curve of best fit for collections of data using a graphing calculator. Use the graph and the equation of the line or curve to predict the behavior of new data. OE
- Write an interpretation of a graph from a newspaper or magazine. OE, P

Applications Across the Curriculum

Language Arts
- Write a persuasive speech using data to support your position. OE, P
- Use data to convince the community to save on energy sources. PE, OE, P

Science
- Research correlation between snowfall and precipitation. Collect samples of undisturbed snow and determine precipitation level. PE, OE, P

Social Studies
- Predict how "the graying" of America will change our society. OE, P

Arts and Humanities
- Design and conduct an experiment mixing complements (colors) to create grays. Determine which are "cool" or "warm" grays. Graph your results. PE, OE, P

Practical Living
- Record the food consumption for a family in a given week; project the cost of the family's food for one year. PE, OE, P
- Predict life expectancy, using a computer program which includes factors such as heredity, lifestyle, gender, and diet. OE

Vocational Education
- Calculate and compare insurance premiums (e.g., cars, health, homeowners). OE
- Use a genetics chart to make predictions in crossbreeding. OE

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Social Studies

Social Studies

> *"If a nation expects to be ignorant and free, in a state of civilization, it expects what never was and never will be."*
>
> **Thomas Jefferson**

War and Peace! Aid for the Family Farm! Equal Rights! The Environment! Issues like these permeate our daily lives. They require us to educate our students so that they will become informed, active, and committed citizens. In order to accomplish this goal, the curricula of our schools should focus on meaningful concerns which will engage students in the process of forming their futures.

The social studies must become an energized area of investigation. Students must become real historians searching and researching for possible answers to questions. They must become real-life problem solvers and critical thinkers. They must be encouraged to go beyond the classroom walls to practice the skills and use the knowledge of the social studies in order to become the participating citizens a democratic society requires.

Implementing KERA in Social Studies Classes

A curriculum framework differs from a curriculum in the respect that suggestions for teaching content are not specified in the framework. This framework contains demonstrators which provide benchmarks and concepts, but it does not tell teachers what to teach. The following question and answer format can assist in determining how social studies courses will be affected by the framework and the Kentucky Education Reform Act (KERA).

What is the role of content in social studies instruction?

The social studies content continues to be a vital part of every student's education. If students have no knowledge of content, they will never demonstrate proficiency of the skills and processes

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Year after year, Ms. Stamper redesigned lesson plans and activities trying to discover how to engage all of her students. Because she could not be satisfied if any of her students were unsuccessful, teaching was a frustrating occupation. No matter what she did, there were still students whom she felt she could not reach.

Finally, she decided to make a drastic change. She began to use lectures sparingly, only for specific purposes, and just in brief intervals. She gave the students responsibility for their own learning and held them accountable for it through writing assignments, performance tasks, and presentations. She found that she was better able to reach those students she could never motivate. Ms. Stamper discovered that everybody, including the teacher, learned more in her transformed classroom.

supported by Kentucky's academic expectations. Presentation of this content by teachers is meaningless unless students have an understanding of the relationship among the content, skills, and processes of the social studies and their application(s) to the students' lives.

One very important and positive aspect of KERA is that teachers, schools, and district personnel have more freedom in determining what content to teach. Decisions about what to teach should be guided by such factors as

- the academic expectations,
- students' needs and interests,
- developmental appropriateness of the content, and
- the knowledge needed to participate as an active citizen in a democracy.

It will be important to provide students with opportunities for an in-depth study of issues and information. Several options are available to teachers, schools, and districts wishing to change their approaches to content presentation. Suggested models for curriculum design and course structure can be found in publications by the National Council for the Social Studies, the Bradley Commission, and others. Alternative instructional programs being explored by Kentucky schools include courses designed around themes, big ideas, essential questions, and key concepts.

On which academic expectations should instruction focus?

It is essential for all students to demonstrate proficiency on all the academic expectations. Successful schools and districts will view this objective as a team effort by teachers and district personnel. Social studies teachers, however, do need to be primarily concerned with the eight social studies academic expectations found in Goal 2. Decisions about which additional academic expectations to target in the other five learning goals will have to be made. Many of them are directly related to social studies education. Because understanding of the social studies is so dependent on use of communication skills, educators need to be familiar with the academic expectations which focus on these processes.

How will social studies education change?

Social studies educators must design curriculum which will afford students an opportunity to provide input into the topics they study. Because of increased awareness of multiple intelligences, learning methods and assessment strategies will have to incorporate flexibility in their design. Teachers must be encouraged to ask "why?" frequently in their instruction. They must use performance tasks often. Students could be required to develop social studies portfolios which include samples of writing and other products (e.g., videotapes, audiotapes, newspapers, pamphlets, art projects, presentations, productions).

Curriculum should not be limited to just what appears in a textbook. Learner goals and academic expectations, student needs, student developmental levels, ideas from professional social studies organizations, teacher experience, and other considerations must be reviewed in order to develop the best possible curriculum. Above all, teachers need to share ideas as they develop and implement curriculum.

There is no "right" curriculum design for social studies. Teachers, schools, and district personnel must begin by making decisions about what is best for all of their students. Beyond that, educators must design curriculum which helps develop the informed, participating citizens required in a democracy.

Are there national standards or models which can be used in developing local social studies curriculum?

The National Council for the Social Studies (NCSS) is currently formulating a set of national standards for social studies education with release scheduled in the fall of 1993. Other organizations have offered guidance in curriculum development for the social studies. In "The Essentials Statements: Essentials of Social Studies," the Board of Directors for the National Commission on the Social Studies has outlined fundamental components of social studies curriculum. An exemplary program is one which

- presents knowledge of the world, its past, present, and future, its individuals, and its institutions.
- stresses the importance of the development and application of democratic beliefs.
- emphasizes thinking skills which are categorized as data gathering, intellectual, decision-making, and interpersonal skills.
- allows students to practice participation skills and promotes their civic action.

Additionally, statements by the National Assessment of Educational Progress, America 2000, the Bradley Commission on History in the Schools, and other publications from the National Council for the Social Studies (NCSS) have established as a priority a social studies curriculum which is prominent in each year of a child's education. Such a curriculum would place value on the study of history, geography, and the social sciences and help to ensure that our students are participants in their world today and in the future.

Social studies is the integrated study of the social sciences and humanities to promote civic competence. Within the school program, social studies provides coordinated, systematic study drawing upon such disciplines as anthropology, archeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences. The primary purpose of social studies is to help young people develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world.

Definition of Social Studies, National Council for the Social Studies

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.14:** **Students understand the democratic principles of justice, equality, responsibility, and freedom and apply them to real-life situations.**

Learning Links: *Voting / Bill of Rights / Jury Duty / Amnesty International / ACLU / Labor Unions / Sound Bites / Community Service / NAACP / Student Council / Supreme Court / Local Government / Civil Disobedience / PTA / United Nations*

Related Concepts: Civic Action / Power / Authority / Comparative Governments / Political Philosophy / Rights & Responsibilities

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Recognize and demonstrate respect for different viewpoints.
- Determine rights and responsibilities in real-life situations.
- Make informed decisions about school or community concerns.
- Demonstrate democratic behavior (e.g., treating others justly, recognizing authority, and respecting the rights and privacy of others).
- Recognize the existence of and the need to follow rules.
- Recognize oneself as part of a group and demonstrate cooperation with others.

Middle School Demonstrators

- Demonstrate rights and responsibilities of citizenship in real-life situations.
- Analyze the relationship between rights and responsibilities of individuals/groups and the needs of society.
- Recognize and use appropriate means of resolving conflict.
- Analyze issues from multiple perspectives.

High School Demonstrators

- Exhibit active democratic behavior and civic responsibility.
- Predict and evaluate consequences of particular actions or behaviors related to democratic principles.
- Evaluate the roles of conflict and consensus.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Service Learning • **Continuous Progress Assessment**: Observation, Portfolio Development, Self-assessment, Performance Events/ Exhibitions • **Graphic Organizers**: Graphic Representations, Time Line • **Problem Solving**: Inquiry, Case Studies, Creative Problem Solving, Future Problem Solving, Debate, Oral History, Simulation • **Technology/Tools**: Computers, Games, Multimedia, Puppets, Video/Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a local politician, attorney, or policeman to speak to the class.
- Ask Boy Scouts, Girl Scouts, 4-H, YMCA, and other local youth organizations to share the rules they follow.
- Participate in a field study at the courthouse. Visit the courtroom, jail, and/or offices of the judge executive, sheriff, and circuit judge to witness the justice system in action.
- Invite representatives of different groups (e.g., ethnic, gender, religious) to discuss democratic principles relative to their status within society.
- Select and participate in a community service project.

Core Concept: Democratic Principles

Sample Elementary Activities

- Develop and implement a p[illegible]o create class rules, conduct elections, and hold periodic class meetings according to parliamentary procedure. PE, P
- Create a wall poster for the school which shows the importance of the First Amendment in your life. PE, OE
- Survey class members to determine their household responsibilities. Discuss how this contributes to the operation of the total family structure. Discuss the results if one member fails to carry out his/her responsibility. P
- Discuss the story of "The Three Little Pigs." Conduct a mock trial where the wolf describes his side of the story and the pigs describe their side. PE

Applications Across the Curriculum

Language Arts

- Explore several children's rights issues prominent in the news. Discuss concerns and questions which are raised. Develop a statement of children's rights and responsibilities. PE, P

Science

- Explore an animal rights issue (e.g., medical experimentation, fur coats, vegetarianism). Develop a presentation which explains what rights you believe animals have in our modern world. PE, OE, P

Mathematics

- Establish a rating scale which measures student opinions about favorite foods in the cafeteria. Present your findings to the cafeteria manager. PE, P

Arts and Humanities

- Read the story of "Goldilocks and the Three Bears." Write a play which represents the points of view of the bears and Goldilocks. Determine if the rights of any were violated. PE, P

Practical Living

- Create and illustrate a poster which displays the rights and responsibilities of each member of your home. PE, P

Vocational Education

- Watch a television show from the 1960s to examine the household responsibilities of family members. Contrast the image portrayed with modern households. OE

Core Concept: Democratic Principles

Sample Middle School Activities

- Role-play a discussion about democracy between historical personalities (e.g., Plato, King George III, Thomas Paine, John Locke, Frederick Douglass, Susan B. Anthony). Create a chart which represents each person's views about democracy. PE, OE
- Create an exhibit in the school which addresses important issues in a democracy. Develop oral and written explanations and select appropriate background music to accompany the exhibit. PE, OE, P
- Create a multimedia presentation, using slides and the lyrics of popular songs, which reflects democratic principles. PE, P
- Debate whether or not parents should be free to choose their children's school. Analyze all positions stated and prepare a position paper to present to the class. PE, P

Applications Across the Curriculum

Variations on a theme: Rights

Language Arts
- Read a book about rights. Consider an important message in the book (e.g., *Animal Farm* - "All animals are created equal but some animals are more equal than others.") and examine whether or not the message applies to real-life situations. OE, P

Science
- Consider issues of justice involved in a scenario where the military is disposing of chemical waste near a community without the residents' consent. OE

Mathematics
- Create a set of pie charts which shows the relationship between ethnicity and clubs in your school. Examine reasons for your findings. Make suggestions to increase ethnic diversity in school clubs. PE, P

Arts and Humanities
- View, study, and discuss the statue entitled "Blind Justice." Create your own artistic representation of justice. Present it to the class with appropriate background music. PE, P

Practical Living
- Examine different situations involving smokers' rights and non-smokers' rights. Apply principles of justice in developing a solution to the conflict. PE, OE, P

Vocational Education
- Examine the history of child labor laws. Prepare an illustrated time line of significant events. PE, P

Reflections

Among the most fundamental reasons for public schools is the need for an educated society in a democracy. School should be the primary place for people to learn about and practice democratic principles. If students are to recognize and internalize the basic issues of justice, equality, responsibility, choice, and freedom, they need to be provided with a multitude of situations and opportunities to experience them.

Today, it is imperative that administrators, teachers, and parents begin to recognize that schools should not only be teaching about democracy but must be allowing students to practice democracy as well. The democratic issues of rights and responsibilities must be woven into the fabric of schools. Students should be expected to be democratic citizens now, not just learning to be the citizens of tomorrow.

In social studies classes, the democratic principles are deliberate academic targets of discussion and study. Incidents in the daily lives of students may also elicit discussion about rights, responsibilities, and liberties. Teachers should take advantage of every opportunity to enable students to learn about democratic principles.

Core Concept: Democratic Principles

Sample High School Activities

- Establish a student judiciary board to conduct trials for cases which involve student violations of school rules. PE
- Prepare for and participate in a debate with a "rights" theme (e.g., right to die, animal rights). Record ideas, changes in opinion, and reflections in a journal. PE, OE, P
- Produce a "how-to" video on the voting process. Have the video shown on local access television stations. PE, P
- Determine your position on gun control and design a campaign to persuade other students to adopt your viewpoint. PE, OE, P

Applications Across the Curriculum

Language Arts
- Investigate the issues surrounding the censoring of books in America. Conduct a debate concerning the reasons for censoring books. PE, OE

Science
- Research examples of the involvement of government in science and ethical issues. Consider why the government might want to censor some scientific and medical knowledge. Analyze the compatibility of this view with democratic principles (e.g., freedom of expression, freedom of thought). OE

Mathematics
- Conduct a survey to determine your community's general view about the issue of censorship and the selling of specific controversial publications. Compare the responses given about both issues. Develop an article for the school newspaper which draws conclusions. OE, P

Arts and Humanities
- Examine the use of federal funds for support of controversial art projects. Debate your position on this issue. PE, OE

Practical Living
- Review the Bill of Rights as a cooperative learning activity and examine how it protects your rights to communicate with others. Determine if the "rights" are outdated and, if so, revise and amend them for today's society. PE, OE

Vocational Education
- Investigate a labor-management conflict. Write an opinion on the issue as it relates to the rights of freedom, privacy, and choice of the individual. OE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.15:

Students can accurately describe various forms of government and analyze issues that relate to the rights and responsibilities of citizens in a democracy.

Learning Links: Police / Civil Rights / Armed Services / Taxes / Censorship / Eminent Domain / Voting / Impeachment / Vigilante / Lawsuit / Separation of Powers

Related Concepts: Justice / Equality / Authority and Power / Conflict and Consensus / Freedom / Privacy / Rights and Responsibilities / Pluralistic Society

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Participate in the political life of the school.
- Explore the purposes and functions of local, state, and national governments.
- Describe elements of familiar political systems (e.g., home, school, club).
- Demonstrate knowledge of the development and purpose of rules and laws.
- Identify sources of authority.

Middle School Demonstrators

- Demonstrate civic participation skills.
- Analyze factors that account for continuity and change in political systems.
- Compare sources of authority and power.
- Compare democratic and non-democratic political systems (e.g., American constitutional government, parliamentary government, dictatorship, monarchy).

High School Demonstrators

- Participate actively in a variety of civic and political activities.
- Evaluate various processes for political change.
- Analyze the impact of ethical beliefs on political systems.
- Analyze the relationship between authority and power in political systems.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Reciprocal Teaching • **Community-Based Instruction**: Field Studies, Service Learning • **Continuous Progress Assessment**: Portfolio Development, Self-assessment, Performance Events/ Exhibitions • **Graphic Organizers**: Graphic Representations, Time Line, Venn Diagram • **Problem Solving**: Brainstorming, Inquiry, Case Studies, Creative Problem Solving, Future Problem Solving, Debate, Interviews, Oral History, Simulation • **Technology/Tools**: Computers, Interactive Video, Multimedia, Puppets • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Interview community leaders (e.g., mayor, sheriff, civic club officers) to identify and discuss their job responsibilities.
- Invite a local representative of a political party to discuss the "give-and-take" of politics.
- Utilize the local newspaper in discussions about current affairs.
- Interview editorialists, former military officers, former protestors, religious leaders, or members of special interest groups to discuss their views of political systems.

Core Concept: Structure and Function of Political Systems

Sample Elementary Activities

- Record your activities for one day. Examine each and determine if there is a rule or law that governs the activity. Identify the source of each rule or law. OE, P
- Design and establish rules for a new game. Justify the rules in the game so the players will understand their purpose. PE, P
- Write and perform a puppet show explaining the need for and purpose of rules in school or in the county. PE, OE, P
- Organize a class campaign and elect a leader to oversee a scientific project. PE, P

Applications Across the Curriculum

Language Arts

- Write to a pen pal in another country and compare rules, rights, and responsibilities in your school with those in your pen pal's school. OE, P

Science

- Write a letter to your local government representative to discover local environmental regulations. Determine whether or not your school is in compliance. PE, P

Mathematics

- Compose a set of classroom rules, responsibilities, and consequences. Revisit the set after a period of time to determine needed adjustments in either the rule or behavior. OE, P

Practical Living

- Investigate the similarities between the way you provide care for your pet and the way your parents care for you. OE, P

Arts and Humanities

- Design a comic book which explores the relationship between power and authority. PE, P

Vocational Education

- Interview persons involved in law enforcement. Draw conclusions about the purpose of rules and laws and who shall be subject to their authority (e.g., "no person is above the law"). P

Core Concept: Structure and Function of Political Systems

Sample Middle School Activities

- Plan a government for a colony on Mars. Design organizational diagrams. Present justifications for your government. PE, OE, P
- Write a constitution for your club or group. Compare your constitution to the U.S. Constitution to find differences and similarities. OE, P
- Study the effect of modern technology on political systems in the world. Determine if technology encourages or impedes democracy. OE, P
- Develop a list of statements under the heading "Why Can't I..." List rules or laws which regulate each concern. Investigate strategies which could be used to change one of the concerns. P

Applications Across the Curriculum

Language Arts
- Interview community leaders to identify common attributes of leadership. Compare these leadership attributes to school leaders. OE

Mathematics
- Analyze the frequency of females elected to office in world politics over the last decade. Predict trends in future elections based on your data. PE, OE, P

Science
- Investigate examples of scientific research developed to benefit people but which were taken over by a political system for its own purposes. Examine how scientists felt and reacted to the government's actions. Suggest ways in which the scientific community could have avoided this. PE, P

Arts and Humanities
- Create an artistic representation of how leadership can involve non-violent (e.g., passive resistance, hunger strikes) behavior. PE, P

Practical Living
- Examine leadership attributes of personalities in the news. Determine how these attributes could be utilized by leaders in a variety of political systems. PE, P

Vocational Education
- Design a flowchart showing the hierarchy of leadership in a workplace. Examine how the workplace resembles a political system. Determine which type of political system it most resembles. PE

Core Concept: Structure and Function of Political Systems

Sample High School Activities

- Volunteer to work in the campaign of a candidate. Keep a journal of your activities. Evaluate your role and the outcome of the campaign. OE, P
- Develop and present a flowchart on a computer showing how a citizen's idea might become the basis of legislation at the local, state, or national level. PE, OE, P
- Analyze controversial issues surrounding Kentucky's constitution. Determine what revisions are needed (if any) and draft a new document or create a defense of the current constitution. Submit and defend these ideas to a panel of lawyers, officials, and educators in the community as a culminating activity. PE, OE
- Compose a musical piece which expresses the ideas found in the political system of the United States. Perform the piece and obtain responses from the audience as an evaluation of the piece's effectiveness. PE, P

Applications Across the Curriculum

Variations on a theme: Political Authority

Language Arts
- Write a short story about your community if it were to suddenly change its political system (e.g., monarchy, dictatorship, communism). Show how your life would be different. OE, P

Science
- Design a presentation which shows how scientific research is used by various political systems. PE, P

Mathematics
- Conduct a demographic study of the world to show populations living under authoritarian and democratic societies. Draw conclusions, explain the evidence, and make predictions about the future of democracy in the world. OE, P

Arts and Humanities
- Compare art and music from Nazi Germany to the United States during the Great Depression. Explain differences and similarities. OE

Practical Living
- Investigate how people living in various political systems might deal with controversial issues found in everyday life (e.g., censorship, education reform, homelessness). OE, P

Vocational Education
- Illustrate ways in which a political system influences the creation of job opportunities. PE, P

Reflections

The study of government, political systems, and economic infrastructures throughout the world are primary components in the field of social studies. Within the context of political systems, students are exposed to the concepts of democracy, authority, power, civic responsibility, civil rights, and the legal intricacies of government. They become aware of differences in political systems as they compare and contrast the democratic and non-democratic models. Through this introduction into the world of political systems, students examine factors of conflict and conflict resolution, continuity and change, and leadership and civic responsibility. It is inherent in social studies that students study the formal structures of government which influence their daily lives. Every opportunity to focus on the political structures and forces that shape governing policies helps students shape their personal and political beliefs. It is through the broad view of political activity throughout the world that students develop their own belief systems on law and ethics. Beginning with the activities included, use every opportunity to infuse the impact and influence of political systems into everyday lessons.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.16: Students observe, analyze, and interpret human behaviors, social groupings, and institutions to better understand people and the relationships among individuals and among groups.

Learning Links: Family / Religion / Workplace / Laws / Holidays/Celebrations / Refugees / Homeless / Migrant Workers / Clubs / Moral Majority / Gangs

Related Concepts: Ethnocentrism / Ethnicity / Cultural Relativity / Pluralism / Prejudice / Discrimination / Group Norms / Equity / Customs / Conformity

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Elementary Demonstrators

- Demonstrate an ability to function as part of a social system.
- Identify a social problem and seek positive change.
- Recognize and respect various individual and group belief systems.
- Identify cultural bias and stereotyping.
- Recognize roles within various social groupings.
- Recognize family similarities and differences.

Middle School Demonstrators

- Modify a social system to effect positive change.
- Evaluate individual responsibilities within various social systems.
- Analyze the impact of social institutions (e.g., religious, educational, occupational, and political systems) in society.
- Examine the consequences of prejudice and discrimination (e.g., age, gender, ethnicity) on social systems.
- Compare the social institutions of different cultures.

High School Demonstrators

- Design strategies to resolve and effect change within a social system.
- Analyze how individual and group beliefs affect social systems.
- Examine the societal implications of personal prejudices.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Mentoring, Service Learning • **Continuous Progress Assessment**: Checklist, Conferencing, Portfolio Development, Self-assessment, Performance Events/Exhibitions • **Graphic Organizers**: Compare/Contrast Structures, Graphic Representations, Time Line • **Problem Solving**: Brainstorming, Heuristics, Inquiry, Questioning, Case Studies, Creative Problem Solving, Debate, Oral History, Role-play • **Technology/Tools**: Computers, Interactive Video, Multimedia • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Identify community action groups such as American Red Cross, Big Brothers and Big Sisters, Habitat for Humanity, SADD, MADD, or Friends of the Earth to determine how students can be involved.
- Invite a local government official to class to discuss how census data is important to the community.
- Survey local citizens to determine social changes occurring or needed in the community.
- Conduct interviews with senior citizens of the community about the type and functions of social organizations in the past.

Core Concept: Structure and Function of Social Systems

Sample Elementary Activities

- Identify different types of families and the different roles within families. Create and present a drama which demonstrates a variety of family structures and roles. PE
- Discuss a social problem such as homelessness or alcohol abuse. Investigate how these social problems could have an impact on students. OE, P
- Write and produce skits depicting appropriate responses when confronted with situations which could lead to inappropriate behavior (e.g., drug/alcohol use, shoplifting, vandalism). PE, OE
- Present an eyewitness newscast in which the reporter interviews Cinderella about how she copes with problems in her family life. PE, P
- Conduct a photo survey of conditions or situations in the community which are in need of attention (e.g., potholes in streets, vacant lots). Send the survey and a letter of explanation to a community leader. PE, OE, P

Applications Across the Curriculum

Variations on a theme: Families

Language Arts
- Dress as one of your grandparents and tell "A Tale My Grandparent Told Me About My Family." Explain the importance of this story to your family. PE, P

Science
- Examine the familial relationships of several different types of animals. Make comparisons between them and human families. Investigate the various roles individuals have in family relationships. OE, P

Mathematics
- Create a chart with suggestions for "How To Be A Good Family Member." Keep track of how many times classmates use the suggestions. Draw conclusions as to why certain suggestions are used more than others. OE, P

Arts and Humanities
- Create a dramatization of "The Old Woman Who Lived In A Shoe" which shows the importance of family members helping each other. PE

Practical Living
- Keep a log recording the food your family eats in a week. Indicate any customs or beliefs of your family that influenced dietary choices. P

Vocational Education
- Investigate types of social services that are available to meet the needs of a family when a parent whose income is vital becomes unemployed. OE, P

Reflections

Through the study of social systems, students are introduced to the customs, beliefs, norms, and roles that guide their actions and behaviors in school and in life. Beginning in the early grades, with the focus on self, family, neighborhoods, and communities, students learn to understand and appreciate their role and the role of others in society.

By involving students in the study of cultures, holidays, customs, celebrations, literature, and laws, students gain not only a global view, but also an appreciation of the similarities and differences that make each society unique.

It is through this early and ongoing experience with social systems that students are able to recognize, analyze, and evaluate their role. Furthermore, it is through this informed exposure to the variations within global societies that they learn to appreciate differences and learn, not only a tolerance, but an understanding of the value of those differences. With this global perspective, students are less likely to harbor feelings of bias, prejudice, and bigotry.

Core Concept: Structure and Function of Social Systems

Sample Middle School Activities

- Critique some older films, television shows, or radio programs in order to detect cultural bias and stereotyping within families from the 1950s and today. OE, P
- Create a picture book for preschool children which would help them cope with a family crisis (e.g., the loss of a pet, birth of a sibling). PE, P
- Establish criteria for responsible group membership. Work in a group and reassess the criteria. PE, P
- Develop a social-service action plan for your school or community (e.g., disaster-preparedness plan for the school). Present the plan to the school council or school board. PE, P

Applications Across the Curriculum

Language Arts
- Read a book about adolescents in another culture. Develop a comparative list of problems, issues, and concerns faced by the characters in the book and modern adolescents. Write a scenario which proposes a way of dealing with the problems. OE, P

Science
- Research the impact that various interest groups have had on science-related discoveries, inventions, or cures. Based on your findings, develop a presentation for a real audience which focuses on the ability of citizens to impact society through group action. OE, P

Mathematics
- Use census data to create graphs of family structures. P

Arts and Humanities
- Read or view the play, *Our Town*. Create and present your own presentation of a play which accurately represents the social status of various people in your community. PE, OE, P

Practical Living
- Brainstorm to create a list of all of the social groups to which you belong (e.g., school, family, church, government). Write a journal entry which examines your role and status in each of these groups. OE, P

Vocational Education
- Design a flowchart showing the hiearchy of decision making in a local business. Evaluate its effectiveness. PE, P

Core Concept: Structure and Function of Social Systems

Sample High School Activities

- Research and investigate the effect of alcoholism on family life in your community. Work to create a support group for people in the community who have experienced the effects of alcoholism. PE
- Develop a chart showing social stratification in the community. Create an action plan to address problems arising from this stratification and present the plan to local community leaders. OE, PE
- Research and investigate the frequency and effect of eating disorders in your school. Work to create a support group for students in the school who are affected by eating disorders. PE, P
- Write a social history (including the daily life of ordinary people) which focuses on a group(s) of people who usually do not receive sufficient emphasis in history textbooks. OE, P

Applications Across the Curriculum

Language Arts
- Investigate incidents of gender bias in your local community. Write a letter to the editor of your local newspaper in which you take a stand on the issue. OE, P

Science
- Research ways in which science has been used to justify, support, or eliminate prejudice. Draw conclusions about the uses of science by different societies. OE, P

Mathematics
- Select a topic which deals with an issue of prejudice or bias. Formulate a valid question, collect data, display the results, analyze the data, and draw inferences. PE, OE, P

Arts and Humanities
- Design a poster which attempts to convey an effective anti-prejudice message. PE, P

Practical Living
- Investigate the availability and affordability of health-care services for a variety of social groups in your community. Examine social factors (e.g., prejudice, socioeconomic status) which may have affected the services provided. OE, P

Vocational Education
- Examine hiring practices in Kentucky for several occupations during the 1950s and for comparative occupations today. Determine the effect that prejudice has played in job opportunities. Support or refute affirmative action. OE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.17:** **Students interact effectively and work cooperatively with the many ethnic and cultural groups of our nation and world.**

Learning Links: United Nations / Immigration / Emigration / National Anthems / Global Village / Telecommunications / Architecture / Language / Folk Tales / Celebrations / Customs / Legends

Related Concepts: Religion / Multicultural Perspective / Diversity / Equity / Equality / Interdependence

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Explore conflict resolution strategies for problems arising from cultural tensions.
- Investigate how our society is influenced by a variety of cultures.
- Recognize that culture is learned.
- Describe cultural universals, similarities, and differences.
- Recognize and respect the right of others to display unique characteristics.
- Explore the uniqueness of the individual.

Middle School Demonstrators

- Develop strategies to work cooperatively with culturally diverse groups.
- Analyze the benefits and problems of living in a pluralistic society.
- Analyze cultural differences.

High School Demonstrators

- Demonstrate multicultural understanding through a variety of real-life activities.
- Design strategies to solve problems arising from cultural differences.
- Analyze the assimilation and non-assimilation of groups into society.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Service Learning • **Continuous Progress Assessment**: Interviews, Observation, Portfolio Development, Self-assessment, Performance Events/Exhibitions • **Graphic Organizers**: Mapping/Webbing, Time Line, Venn Diagram • **Problem Solving**: Inquiry, Case Studies, Creative Problem Solving, Future Problem Solving, Debate, Oral History, Simulation • **Technology/Tools**: Computers, Interactive Video, Multimedia • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite community members of various cultural backgrounds to help plan and participate in a cultural exhibition.
- Interview representatives of private businesses and industries to learn about their international linkages.
- Contact the Bluegrass International Program, Japan/America Society, Kentucky International Education Program, or similar organizations for multicultural resources.

Core Concept: Cultural Diversity

Sample Elementary Activities

- Research other cultures to identify behaviors that are considered to be rude and impolite. Dramatize the findings. Compare the rude and impolite behavior to acceptable and non-acceptable behavior in our society. PE
- Read a literary selection such as Nolen's *Hats, Hats, Hats* and work in teams to create books about cultural elements common throughout the world (e.g., food, clothing, shelter). Present the books to younger children. PE, P
- Interview someone who grew up in a culture other than your own. Examine and discuss differences between the two cultures. P
- Develop an album of different cultures using pictures from a magazine. P
- Tell the story of a famous historical person who was involved in a conflict (e.g., Rosa Parks, Martin Luther King, Jr.). Explain how the person dealt with conflict resolution. PE, OE, P

Applications Across the Curriculum

Language Arts
- Prepare a tasting party of ethnic dishes for another class. Plan and implement the following tasks: budget, menu, invitations, decorations, entertainment, food preparation. PE, P

Science
- Compare daily dress to the ceremonial dress in various cultures. Present your findings. PE, P

Mathematics
- Collect and organize information related to your ancestors' birthplaces. Prepare a presentation of your findings. PE, P

Arts and Humanities
- Create a collage showing how people from diverse cultures have influenced American history. PE, P

Practical Living
- Interview older members of a given culture regarding their leisure activities as children. Determine the influence of the past on the leisure-activity choices in that culture today. OE, P
- Interview immigrants to determine cultural health remedies and treatments for diseases. Present the findings. PE, OE, P

Vocational Education
- Investigate customs linked with your family's culture. Exchange this information with class members. PE, P

Core Concept: Cultural Diversity

Sample Middle School Activities

- Construct a list of the groups not represented at the Constitutional Convention in 1787; speculate about how the Constitution might have been different if the groups not represented had been present. Communicate these differences. PE, OE
- Study slave narratives and other primary sources from American history. Compare the view expressed in these documents to modern views about minority groups. Analyze whether or not racism is more or less prevalent in the United States today. PE, OE
- Investigate the inequities in the treatment of minorities in the local community. Develop a presentation about your findings. PE, P
- Organize a club in your school which works to promote cultural understanding. PE, P

Applications Across the Curriculum

Variations on a theme: Identities

Language Arts
- Examine the idea of national stereotypes as portrayed in a novel (e.g., *My Darling, My Hamburger* by Paul Zindel). Compare and contrast this idea to your own and your classmates. OE, P

Science
- Chart the influx of other cultures into the United States over the last 200 years. P

Mathematics
- Prepare several different charts showing how the influx of various cultures into the United States has influenced demographic changes. P

Arts and Humanities
- Create a collage showing how people from diverse cultures have influenced American history. Present the collage to the class. PE, P

Practical Living
- Make costumes celebrating cultural diversity in the United States. PE, P

Vocational Education
- Discuss the identification of certain cultural groups with certain occupations in the United States. OE

Reflections

Worldwide travel, changing political boundaries, open trade agreements, and instant communications have created what is called the global community. Technology links nations and in some cases transcends the language barriers in this global community, but the culture and customs of the various people remain honored traditions.

To acquaint students with the richness of this global mosaic is to set the stage for future interactions, collaborations, and partnerships; to acquaint students with the diversity of our world is to bring together the universal traits that lace together all the cultures. The listed activities suggest exploration and examination of the various racial, ethnic, and cultural phenomena. Also, there are many opportunities throughout the curriculum to investigate the cultural diversity in holistic, integrated units.

Core Concept: Cultural Diversity

Sample High School Activities

- Create and present a video tour of the central states which examines the movement and settlement of diverse cultures throughout the country. Present your video to the class. PE, P
- Design and sponsor a community workshop which promotes cultural awareness and conflict resolution. PE, P
- Research and analyze the attitudes of minorities about local issues. Present findings and recommendations to local civic and political leaders as a basis for revising local policies. PE, P
- Investigate a student exchange program which involves students from various cultures located in the state, nation, or world. OE, P

Applications Across the Curriculum

Language Arts
- Identify diverse ethnic and cultural groups in your community. Study the lifestyles of each group to determine similarities and differences of each group. Plan a community event which celebrates the commonality of all the groups. PE

Science
- Debate the issue of different cultures (e.g., Native Americans) being able to use a controlled substance in a cultural ceremony. PE

Mathematics
- Research the demographics of various ethnic groups in the United States. Graph the findings and make predictions about future trends. OE, P

Arts and Humanities
- Research customs, past and present, on culture and present findings through multimedia (e.g., videos, photos). PE

Practical Living
- Investigate the various health-care services provided by different governments. Determine how cultural influences have impacted government participation in the health-care system. Present your findings. PE

Vocational Education
- Research salaries for occupations in a variety of cultures. Make inferences about the status placed on individuals holding these occupations in their society. Justify your findings to the class. PE

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.18: Students understand economic principles and are able to make economic decisions that have consequences in daily living.

Learning Links: Black Market / Capitalism / Deficit / Inflation / Money / Stock Market / Banks / Credit / Automation / Imports / Cost of Living / Socialism / Utopia / Fiscal Policy / IRS / Advertising

Related Concepts: Interdependence / Goods & Services / Comparative Economics / Wants & Needs / Consumption & Production / Personal Finance / Decision Making / Trade & Migration / Opportunity Costs / Scarcity / Supply & Demand / Markets

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Develop informed decisions based on a variety of economic considerations.
- Explore interdependent relationships among personal, local, state, national, and international economies.
- Recognize and apply fundamental marketing strategies (e.g., survey, cost analysis, product development).
- Understand the importance of planning and maintaining accurate records of budgeting and other financial activity.
- Recognize and apply fundamental economic concepts (e.g., wants and needs, supply and demand, scarcity).

Middle School Demonstrators

- Predict consequences of personal or group economic choices (e.g., spending versus saving, economic development versus environmental preservation).
- Analyze relationships among economic factors (e.g., political structure, natural resources, population, technology) and the interdependence of nations.
- Examine ways cultural heritage influences economic decisions.
- Analyze the effects of economic factors (e.g., supply and demand, wants and needs) on decision making.

High School Demonstrators

- Analyze, demonstrate, and defend real-life economic decisions.
- Analyze the interdependence of personal, national, and global economic issues and concerns.
- Explain how economic systems reflect real-life situations (e.g., trade deficits, employment).

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning• **Community-Based Instruction**: Field Studies, Service Learning • **Continuous Progress Assessment**: Portfolio Development, Self-assessment, Performance Events/Exhibitions • **Graphic Organizers**: Graphic Representations, Time Line, Venn Diagram • **Problem Solving**: Inquiry, Creative Problem Solving, Future Problem Solving, Debate, Formulating Models, Interviews, Oral History, Research, Simulation • **Technology/Tools**: Computers, Interactive Video, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite local marketing agency employees to be resources, presenters, or mentors for students engaging in marketing projects.
- Contact Junior Achievement or the Kentucky Council for Economic Education for ideas and resources on economic education.
- Identify employers in your area and study their impact on the local economy.
- Ask a representative from the local chamber of commerce to discuss the changes in the local economy over the last 50 years and make predictions concerning changes in the next 50 years.

Core Concept: Structure and Function of Economic Systems

Sample Elementary Activities

- Form a business that involves producing goods (e.g., brownies, books) or a service (e.g., raking leaves). Apply fundamental economic concepts and determine the success of the project. PE
- Analyze and chart techniques that advertisers use to sell toys (e.g., Saturday morning cartoons, animated movie characters). Prepare a consumer awareness presentation. PE, P
- Create a graphic organizer that illustrates the impact of automation on the world of work. Present and describe the organizer to a panel of students. PE, P
- Participate in a "barter-day" where you trade items with other students. Discuss the convenience of money. PE, P

Applications Across the Curriculum

Language Arts

- Create an advertising slogan which would convince children to purchase your favorite new toy. PE, P

Science

- Analyze reasons why the cost of a new invention decreases over time. P

Mathematics

- Purchase activities for a car trip (e.g., books, games, puzzles) with a $10 budget. PE

Arts and Humanities

- Create a play about a homeless child's wants and needs. PE

Practical Living

- Determine which daily-use items are wants and which are needs. Use drawings and pictures from magazines to create a chart that shows your findings. Present the chart to your class. PE, P

Vocational Education

- Do a comparative study of your wants and needs. Determine the salary range needed to satisfy your wants and needs. P

Core Concept: Structure and Function of Economic Systems

Sample Middle School Activities

- Evaluate economic decisions with a cost-benefit analysis. Select a product for purchase and consider both the costs (what is given up) and the benefits (what is gained). Chart the findings and present. PE, OE
- Evaluate the relationship among supply, demand, and costs of a seasonal product (e.g., tomatoes, August-November; Christmas Trees, Thanksgiving-Christmas Day). Compare costs biweekly at various sites and create a chart to display findings. PE, OE, P
- Prepare a "mock" budget for a family in the community. Present the budget and include a rationale for the decisions and major financial problems which may be faced by the family. PE
- Create a business that will generate income from recycled products. PE, P
- Design a marketing strategy for a product important to middle school students. Analyze the effectiveness of the strategy. PE, OE, P

Applications Across the Curriculum

Language Arts
- Write a jingle which could be used to advertise a product designed for adolescents. PE, P

Science
- Research the cost of obtaining animals for a zoo. Compare/contrast the prices of various animals. Relate to supply and demand. OE, P

Mathematics
- Investigate what factors determine the value of a baseball card. Find the price of the most expensive baseball cards. OE, P

Arts and Humanities
- Research the rising prices for works of art in recent years. Relate the prices to the concept of supply and demand. OE, P

Practical Living
- Explain to a class of elementary school students how supply and demand influences the cost of items in a grocery store. PE

Vocational Education
- Investigate the historical and present-day connections between supply and demand and the availability (and salary ranges) of jobs. Predict what job opportunities might be available in the future. OE, P

Core Concept: Structure and Function of Economic Systems

Sample High School Activities

- Investigate how the state lottery functions. Use a computer to develop a cost-benefit analysis for the state. Write a position paper which considers whether or not the state should have a lottery. P
- Develop a list of goods and services that are scarce in the community. Discuss possible causes for the scarcity and suggest ways that the community can deal with the problem. Present your findings to the local planning commission. PE
- Solve an economic problem using the techniques of two different economic systems. Present a possible solution and predict long-term implications of that solution to a panel of teachers and local business leaders. PE

Applications Across the Curriculum

Variations on a theme: Interdependence

Language Arts
- View the movie *Blue Planet*. Compare and contrast the production to other portrayals of planet Earth. OE, P

Science
- Research "Greenpeace" to learn about an interdependent ecological effort. Draw conclusions on how this effort impacts the world economy. OE, P

Mathematics
- Create a time line showing major events dealing with economic interdependence. Extend the time line to make predictions about the future. PE

Arts and Humanities
- Research the amount of money that has been provided by the federal government to support the National Endowment for the Arts (NEA). Investigate governmental support for the arts in Great Britain, France, and Germany. Debate the importance of government support for the arts using information collected. PE, OE, P

Practical Living
- Research various items used each day. Determine their country of origin and draw conclusions about economic interdependence. OE, P

Vocational Education
- Analyze and present findings on how the North American Free Trade Agreement affects economic interdependence. OE, P

Reflections

R. Buckminster Fuller envisioned a global community which he metaphorically called "Spaceship Earth" in his book, The Critical Path. *In this discussion, he describes a worldgame in which all the resources in the world are redistributed and the economic well-being of every human being is guaranteed. In this utopian plan, he understands that there are enough essential resources for all to live at some level of human dignity. To understand the reallocation of resources and the delicate balance of the many economic factors that influence this "Spaceship Earth," students need schooling in the fundamental concepts of economics, such as scarcity, supply and demand, goods and services, producers and consumers, and opportunity costs.*

Students already understand wants and needs, and income and expenses, through their everyday interactions with real economics. They also need to understand the complicated interdependence of the factors in various economic scenarios. Along with the explicit focus on economics as part of the traditional social studies curriculum, activities can be structured that provide opportunities to investigate and solve economic problems, since topics such as budgets, costs, and best buys fit with other curriculum units of study.

*Source: R. Buckminster Fuller—*The Critical Path

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.19:** **Students recognize and understand the relationship between people and geography and apply their knowledge in real-life situations.**

Learning Links: Pollution / Culture / Rivers / Climate / Endangered Species / Erosion / Agribusiness / Famine / Overpopulation / Earthquake / Desalinization / Space / Biomes

Related Concepts: Location / Place / Regions / Relationships Within Places / Movement

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Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Examine the interaction between people and their environment and predict trends.
- Compare regions to identify unifying characteristics.
- Explain the influence of geographic factors on human movement.
- Use geographic sources of information and data for a purpose.
- Use a variety of means to identify absolute and relative location.
- Recognize that everything has a location.

- Evaluate the influence of geographical factors in real-life decisions.
- Analyze relationships among people, places, and events using geographic skills and resources.
- Analyze geographic characteristics (e.g., landforms, waterways, climate, and natural resources) to explain human/regional relationships.

- Evaluate the impact of geographic factors on real-life issues.
- Analyze and evaluate geographic considerations in making decisions.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, • **Community-Based Instruction**: Field Studies, Service Learning • **Continuous Progress Assessment**: Interviews, Portfolio Development, Self-assessment, Performance Events/ Exhibitions • **Graphic Organizers**: Graphic Representations, Mapping/Webbing, Storyboard, Time Line, Venn Diagram • **Problem Solving**: Inquiry, Case Studies, Creative Problem Solving, Future Problem Solving, Debate, Interviews, Oral History, Simulation • **Technology/Tools**: Computers, Games, Interactive Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Obtain information from the Kentucky Tourism Cabinet about significant geographic locations in the state (e.g., Mammoth Cave, Kentucky Lake).
- Contact chambers of commerce nationwide and local travel agencies about the geography of other states.
- Utilize an electronic bulletin board to communicate with others.
- Invite a local agronomist to discuss the influence of geographic factors on land use and development.
- Contact the Kentucky Geographic Alliance to obtain resources about geography.
- Contact the National Guard or a military base for information about the infuence of topography in military movements.

Core Concept: Relationship of Geography to Human Activity

Sample Elementary Activities

- Create a classroom grid to show the absolute location of the students, teacher, and furniture in the room. Extend the activity to include relative location. Present and explain the grid. PE, P
- Create and present a riddle about one of the fifty states. Include at least five pieces of relevant information concerning geographic location. Sequence clues from general to specific. PE
- Create a scale map of your town and apply the five themes of geography to explain it. PE
- Prepare a tasting party of ethnic dishes for another class. Explain how geography influences the diets of people around the world. PE
- Develop a travel brochure of an Asian country and what tourists will see there. PE, OE, P

Applications Across the Curriculum

Variations on a theme: Location/Place

Language Arts

- Read a novel (e.g., *My Side of the Mountain; Sign of the Beaver; Sarah, Plain and Tall*) and explain how geography affected the life of the central character. OE, P

Science

- Construct a topographical map with various types of terrains. Predict where cities might develop and explain the reasons why. PE, P

Mathematics

- Make a pictorial chart showing the relationship between altitude and climate. PE

Arts and Humanities

- Study totem poles and research how they express cultural beliefs. Create and present a totem pole representation of your culture. PE

Practical Living

- Analyze the relationship between the location and features of houses built in various areas around the world. Build a scale model of one of the houses. OE, P

Vocational Education

- Relate types of jobs to the geography of an area. PE

Reflections

The study of geography—regions, climates and products, resources and relationships—is as old as humankind. Natural phenomena such as earthquakes, erupting volcanoes, glacial mountain ranges, and traveling icebergs are topics students love to explore. Not only are these topics motivating to youngsters, they are also relevant in their everyday lives. They hear and read about these disasters on the news.

Moreover, geography focuses on environmental concerns which affect us all. To be environmentally aware is not only expected of today's young citizens, it is critical to their futures. Problems caused by mankind must be solved by mankind: air, water, and even noise pollution are crucial issues that demand our attention. The possibilities for incorporating geographical data, charts, maps, and global studies into existing curricular units is unending. Many thematic models target the environment as the organizing concept across disciplines. You can thread environmental issues, map skills, and the changing globe into everything you do in the classroom.

Core Concept: Relationship of Geography to Human Activity

Sample Middle School Activities

- Prepare a videotape showing relevant geographic features of the local area. Hold a round-table discussion after the video to consider the impact of geography on the community. PE, P
- Identify sites for locating a factory, a school, or a park in your community. Use aerial photographs and other resources to choose a site. Submit your plan to a panel of teachers and planning experts for evaluation. PE, OE, P
- Create a brochure, including maps, which explains local geography and points of interest for newcomers in the community. PE, P
- Draw a map of your county which shows directions for getting from school to every student's home in the class. Distribute the map to class members for future reference. PE, P

Applications Across the Curriculum

Language Arts

- Read a book in which a character relocates (e.g., *In the Year of the Boar and Jackie Robinson*). Explain how the character's move affects the story. P

Science

- Research how a volcanic eruption can affect the climate in other parts of the world. Present your findings. PE, OE

Mathematics

- Design a travel itinerary from Tucson, Arizona to Hartford, Connecticut. On a budget of $1,000, visit ten cities and explain geographic features which contribute to the uniqueness of each. OE, P

Arts and Humanities

- Analyze how artists' (e.g., Matisse, Gaugain) works reflect their changing environments. OE, P

Practical Living

- Chart the spread of a communicable disease from one region to another. P

Vocational Education

- Research how and why businesses choose various locations for their industry. Explain your findings to a group of your peers PE, P

Core Concept: Relationship of Geography to Human Activity

Sample High School Activities

- Produce a presentation for middle school students which explains the relationship between Kentucky's geography and the state's economy. Suggest solutions to economic problems which are supported by geographic conditions. PE
- Build a model rocket with a camera in the payload. Launch the rocket over a geographically significant area of land in the community and build a scale model showing major geographic features depicted in the picture. PE
- Use a series of news or historical accounts and other relevant data to determine the relationship between an event and its location. Create maps and visuals to use in support of your conclusions in a presentation. PE
- Investigate how the movement of industrial pollution from the United States has affected the environment in Canada. Hold a debate focusing on the responsibility of nations to control pollution emissions. PE, OE

Applications Across the Curriculum

Language Arts
- Write a story which examines the relationship between the individual and his/her environment. OE, P

Science
- Analyze the impact of communication technology on the exchange of information. OE, P

Mathematics
- Study man-made canals which have facilitated the movement of people and goods. Calculate distance and times involved from one point to another in pre-canal and post-canal periods. OE, P

Arts and Humanities
- Observe the portrayal of geographic features in different works of art (e.g., Winslow Homer, Japanese landscape). Create art works to reflect the six regions of Kentucky. PE

Practical Living
- Study diseases that occur in different parts of the world. Relate how geography is involved in the occurrence and prevalence of the diseases. PE, OE, P

Vocational Education
- Predict jobs of the future and where they might be located in the world. Prepare a series of maps which illustrate your findings. OE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.20: Students understand, analyze, and interpret historical events, conditions, trends, and issues to develop historical perspective.

Learning Links: Revolution / Transportation / Technology / War / Migration / Futurism / Tyranny / Scientific Discovery / Education / Human Rights / Religion / Literature / Humanities / Geography

Related Concepts: Social Forces / Cause-and-Effect / Change / Continuity / Multiple Causation / Interpretation / Trends / Historical Events / Historical People / Primary & Secondary Sources / Historical Documents

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Make inferences about issues, events, or people based on historical data.
- Explore temporal relationships of historical events.
- Examine cause-and-effect and multiple causation.
- Recognize continuity and change.
- Distinguish among the past, present, and future.

Middle School Demonstrators

- Evaluate the impact of historical factors on the development of current issues.
- Use historical perspectives and trends to develop understanding of current personal or social events.
- Examine the interpretive nature of historical accounts.

High School Demonstrators

- Synthesize historical perspective with current data in practicing political and civic participation.
- Interpret events utilizing historical investigation.
- Interpret events using historical perspective.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Reciprocal Teaching • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Anecdotal Records, Self-assessment, Performance Events/Exhibitions • **Graphic Organizers**: Advance Organizers, Mapping/Webbing, Storyboard, Time Line, Venn Diagram • **Problem Solving**: Inquiry, Case Studies, Creative Problem Solving, Future Problem Solving, Debate, Interviews, Oral History, Research, Role-play, Simulation • **Technology/Tools**: Computers, Games, Interactive Video, Multimedia, Video/Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Ask leaders of local service organizations to participate in the development of a time line of the community's major historical events.
- Interview citizens from your community to compile a local oral history.
- Contact the Kentucky Historical Society or Museum of History and Science to obtain resources or guest speakers.
- Contact county residents to obtain information and artifacts for the creation of a local archives in the school library.
- Contact the Census Bureau for information about historical changes in demographics.

Core Concept: Historical Perspective

Sample Elementary Activities

- Develop and present a demonstration which shows and explains historical changes in the community. Use past and present photographs of the community. PE, OE, P
- Stage an accurate dramatization of an historical event. Rewrite the ending to show how different decisions could have created different consequences. PE, OE
- Read a story, historical account, or primary document and discuss the causes-and-effects of the various characters' actions. Create a comic book showing the story in pictures. PE, P
- Make an abecedary about a group of Native Americans in history. Present and explain the book to your parents. PE, OE, P

Applications Across the Curriculum

Language Arts
- Read a story set in the time when your grandparents were children. Write about some of the differences between their experiences and your experiences. OE, P

Science
- Examine three different scientific discoveries which have been made in history. Determine the order in which the discoveries were made and explain why the discoveries were made in that sequence. PE, OE, P

Mathematics
- Use manipulatives to represent periods of time (e.g., towers of blocks representing the ages of grandparents, parents, and self). PE

Arts and Humanities
- Research the history of your school. Prepare an artistic representation that illustrates that history. PE, OE, P

Practical Living
- Research the history of a sport or leisure activity. Develop a time line which records important events in that sport and corresponding events in history. PE, P

Vocational Education
- Discuss with grandparents and parents what occupations they wanted to hold when they were children. Write explanations for any differences between childhood plans and actual jobs or careers. OE, P

Core Concept: Historical Perspective

Sample Middle School Activities

- Use primary sources to interpret an historical event (e.g., Who fired the first shot in Lexington?). Present your findings to a panel of students and teachers. PE, OE, P
- Analyze and interpret information about the application of free speech during a historical event. Compare and contrast views about free speech in the historical time and today. PE, P
- Design a pictorial display with captions showing a trend in western civilization. PE
- Design a "History Day" where students in your school participate in activities representative of a selected era in history. PE, OE, P

Applications Across the Curriculum

Variations on a theme: Transitions/Change Over Time

Language Arts
- Read *Frankenstein* by Mary Shelley. Investigate why *Frankenstein* was written in the early nineteenth century. Write a story about a monster created by the science of modern times. OE, P

Science
- Develop a museum exhibit which demonstrates how people's ideas of monsters have changed over the years. Show how that change is a response to technological changes. PE

Mathematics
- Develop a chart showing the relative heights of movie and literary monsters covering a span of two centuries. Include the description of the process used to estimate when actual dimensions are not given. PE

Arts and Humanities
- Create a monster video using equipment and effects to which you have access. Design a movie poster representative of at least two different time periods for your movie (e.g., the 1950s and the 1990s). PE

Practical Living
- Submit a budget in advance for your production of a monster movie. How would the budget have changed if you had wanted to produce a monster movie 20 years ago? Predict what a budget would be 20 years from now. OE, P

Vocational Education
- Design sets for use in your monster video. PE

Reflections

Most students think history is just a bunch of dates, names, and facts. Good teachers of history, though, are able to fill their classes with meaningful questions, thoughtful discussions, and intriguing challenges which stir the curiosity and imagination of students. In this way, students are able to appreciate and find purpose in the study of history.

As a subject, history is much more than the boring roll call of events without relevance that many students seem to believe it is. When presented with a breadth and depth which uses inquiry, problem solving, and critical thinking, history comes alive for students with the excitement of a mystery, the fun of a good story, and the fascination of insightful discovery.

Weaving historical data and even more importantly, a sense of our historical heritage into the fabric of literature, art, music, and even scientific discovery, provides an easily integrated humanities approach to study-units that students enjoy and benefit from in subtle ways. Every teacher is a teacher of history—that is your legacy to these young minds.

Source: Fogarty—The Mindful School: How to Integrate the Curricula

Core Concept: Historical Perspective

Sample High School Activities

- Conduct a debate on a major historical issue using individuals representing different time periods and historical perspectives (e.g., *Meeting of the Minds*). PE
- Put "War" on trial. Conduct a vote after the trial as to whether or not "War" should be outlawed in the world. Write a reflective essay about the experience. PE, OE, P
- Create a traveling museum based on an historical theme. PE
- Develop and deliver an oral history presentation of your community based on interviews of local citizens. Present your product to a group of students. PE, P
- Create an interactive video showing people of today interviewing historical figures. PE

Applications Across the Curriculum

Language Arts

- Read the biography of a famous person. Analyze whether or not the person became famous because he/she was able to influence the forces of history or if the forces of history enabled the person to become famous. OE, P

Science

- Research the life of a person who created a major technological invention. Determine the factors which led to this person's discovery (e.g., prior knowledge, the inventor's associations with other scientists). Explain the effect if the inventor's discovery had been delayed by ten years. OE, P

Mathematics

- Research the voting trends in several presidential elections. Calculate how the elections might have had different results if the voters had lived in different states, if one or more voters in each precinct had voted for the losing candidate, or if other variations in voting patterns had occurred. OE, P

Arts and Humanities

- Create a mural which depicts the achievements and obstacles faced by an individual in an historical situation. PE, P

Practical Living

- Place yourself in a crucial situation in history. Analyze how you may have been able to influence the outcome of the situation had you been "an average person on the street." Examine ways in which you might use ideas developed in this activity to influence modern situations. OE, P

Vocational Education

- Examine the reasons for the development of labor unions in the United States. Explain how this development shows the ability of groups to influence history. Analyze other areas in which collective action has become a necessity in order for people to deal with problems. OE, P

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Arts and Humanities

Arts and Humanities

From the dawn of civilization, the arts and languages have been essential parts of the human experience. They provide a record of the finest achievement of the human spirit and are a means by which we define and measure culture. Even a culture whose language is unknown or indecipherable can speak to us through its arts.

The arts form a basis of civilization and reveal dimensions of our cultural heritage and diversity accessible in no other way. They reflect the vision and the aspirations of humanity offering a means to express the otherwise inexpressible. The arts communicate and shape human thoughts and feelings.

Creativity and Communication

The arts and humanities provide an outlet for human creativity and self-expression. Instruction in the arts cultivates multiple forms of literacy by developing intuition, reasoning, and imagination leading to unique forms of communication. The local arts and humanities curriculum should be developed using all the learning goals and the arts and humanities academic expectations from Goals 1 and 2. The arts teach students to cope with ambiguity and subjectivity because in the arts, as in the world, there is often no single right answer.

Existing and emerging technologies will profoundly alter the way art works and languages are created, viewed, and taught. Beyond the use of technological media for expression, students can learn to synthesize, integrate, and construct new meaning from the wealth of information and resources available through technology.

This year, the school's Renaissance Fair included the following: arts and crafts demonstrations and displays, puppetry, madrigal singers, juggling, acrobats, calligraphy, Commedia theatre, chess tournament, catapult display, maypole and sword dance, mask making, food, mime, pottery, wandering minstrels, poetry readings, and a fully costumed Renaissance pageant.

The teacher who served as fair coordinator explained to the newspaper reporter, "The Renaissance fair was an effort to celebrate the heritage of the arts and humanities within the school and community. It was an outgrowth of the interdisciplinary approach to teaching and learning. The students involved were studying the Renaissance period in their English, social studies, foreign language, and arts classes. The fair was just one way the students were able to combine and connect the knowledge they acquired in those classes."

The Arts—Dance, Drama, Music, Visual Arts

The arts bring joy, excitement, and exhilaration to the learning process, actively engaging students. Children begin learning through drawing, making up rhythmic sounds, moving and dancing, imitating language, and playing imaginative games. Effective arts and humanities instruction builds upon these early experiences and extends them through a comprehensive curriculum which addresses the multiple intelligences and learning styles of students. Students who develop their musical, kinesthetic, spatial, linguistic, and personal intelligences through the arts can demonstrate proficiency in many of the other KERA goals and academic expectations through projects and performances.

The arts and humanities may often be used to facilitate and enrich the teaching of other subject matter. However, they must maintain their individual integrity in the curriculum and be taught for their own innate value.

Multiculturalism

Children should be familiar with their own heritage and with the arts and languages of the many ethnic and regional cultures represented in our state, the nation, and the world. The teaching materials selected for use in the classroom should consistently and systematically include a balance of diverse periods, styles, forms, and cultures.

Language and Second Language

The study of the form, diversity, and similarities of language provides students with a basis of communication with others in our interdependent society. Second language proficiency increases understanding of other people and cultures, enabling students to operate more effectively in a global and multicultural environment.

National Standards

The information in this framework, combined with national content and achievement standards in music, visual arts, dance, drama, and second language, will provide teachers with the basis for designing local curriculum and assessments. Voluntary national standards in dance, drama, music, and visual arts are being developed by the National Committee for Standards in the Arts and will be available for review in mid-1993. The arts will be included in the 1996 National Assessment of Educational Progress (NAEP) and a consensus assessment framework, based on the national standards, is being developed by the Council of Chief State School Officers.

Students at Stanton Elementary in Powell County practice for a performance. **Photo by Rick McComb.**

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.22: Students create works of art and make presentations to convey a point of view.

Learning Links: Fashion / Brochures / Storytelling / Folk Art/Fine Art / Radio / Music Video / Choreography / Photography / Advertisements / Cartoon / Movie / Architecture / Opera/Musical / Journal / Theatre / Mystery / Jazz

Related Concepts: **General:** process, composition, craftsmanship, creative experience, intention, theme
Specific: *Music* - rhythm, melody, form, harmony, expression, style, motion, notation
Dance - movement, space, time, force, technique, expression
Drama - plot, action, characterization, conflict, theme, mood, movement
Visual Arts- Elements: line, shape/form, color, value, space, texture.
Principles: balance, contrast, emphasis, variety, repetition, movement, pattern, proportion, distortion, rhythm, transition/gradation, dominance/subordination, harmony, unity.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Reflect on, interpret, and revise own work and/or works of others in music, visual arts, dance, and drama.
- Produce and/or perform original and existing individual and group works of art.
- Discuss works of art using appropriate concepts and terminology.
- Create original visual art and create and/or perform original and existing works of music, dance, and drama.
- Explore the elements and principles of art forms.

Middle School Demonstrators

- Analyze the creative expression and technical quality of own and/or others artwork using appropriate terminology and concepts.
- Plan, produce, present, and/or perform original and existing individual and group works of art using appropriate elements, concepts, and principles of visual arts, music, dance, and drama.

High School Demonstrators

- Plan, produce, present, and/or perform complex, original, and existing individual and group works of music, visual arts, dance, and drama using appropriate arts elements, concepts, and performance techniques.

Sample Teaching/Assessment Strategies:

Collaborative Process: Brainstorming, Cooperative Learning • **Community-Based Instruction**: Apprenticeship • **Continuous Progress Assessment**: Portfolio Development, Self-assessment • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Creative Problem Solving, Formulating Models, Role-play, Simulation • **Technology/ Tools**: Multimedia, Puppets, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Work with a local quilter to design and produce a quilt for a homeless shelter.
- Invite a local writer or poet to read favorite poems as an introduction to writing poetry.
- Ask a cosmetologist to assist in applying makeup for a drama production.

Core Concept: Production

Sample Elementary Activities

- Create and present an original cartoon with plot, characters, and setting. PE, P
- Perform a pentatonic song using hand movement, body percussion, percussion instruments, and pitched instruments. PE
- Sing a simple song; choose rhythm instruments for the accompaniment and perform. PE
- Listen to a piece of music and create body movements for the rhythm of the theme. Analyze the durations in the theme, and create word rhythms to the rhythmic pattern. PE
- Create a sculpture from soap, wood, or clay using the subtractive process. Create another from clay, paper maché, or cardboard using the additive process. PE
- Use basic geometric shapes to produce patterns or images in a collage. PE, OE, P
- Use a variety of techniques to produce the illusion of depth including overlapping, converging, lines, size, detail, color, placement. PE
- Pantomime the opening of a gift and the revealing of its contents. PE
- Use rhythm instruments to create and perform simple question/answer phrases . PE
- Plan and create an art work that is appropriate for a day care center. PE, P

Applications Across the Curriculum

Variations on a theme: Fairy Tales

Language Arts
- Put on a production of a fairy tale from another country. PE, P

Science
- Design a diorama of the set for the fairy tale. PE, P

Mathematics
- Put the 3-dimensional diorama design on grid paper to use in laying out the actual set. PE

Social Studies
- Choose music from the country of the fairy tale to accompany the production. PE, OE

Practical Living
- Design the set and costumes for the production of the fairy tale. PE, P

Vocational Education
- Prepare a playbill for the production. PE, OE, P

Reflections

The creation, planning, implementation, and evaluation of a product or a performance are the ideal in experiential learning. Authentic representations of student development are evidenced through their creations. Music, dance, drama, and the visual arts provide fertile ground for student creations which can demonstrate their thinking, knowledge, and understanding. Often these creative projects serve as synthesizing or culminating activities to comprehensive units of study.

Not only are these ideas motivating and compelling for students, but their application brings together a number of significant behaviors that include cooperative skills, thinking skills, conceptual learning, organizational skills, and research skills as well as the musical, spatial, kinesthetic, interpersonal, and intrapersonal intelligences. Cognitive research suggests that these authentic tasks are exactly the kind of holistic learning experiences that stay with students; the kind of meaningful scenarios that provide valuable lessons for future life situations.

Source: Costa, Bellanca & Fogarty, Eds.—If Minds Matter: A Forward to the Future: Designs For Change

Core Concept: Production

Sample Middle School Activities

- Listen to a musical selection; draw appropriate images representing emotions you associate with the music. PE, OE
- Create and perform a folk dance using movement, music, colors, and words to convey a contemporary or historical idea. PE, OE, P
- Explore art of a specific era; find complementary music and create a movement sequence which conveys the feelings, moods, and culture of the period. PE, OE
- Use sign language to perform a vocal selection. PE
- Select recorded music and visual art for background to a reading of your favorite story, poem, or dance. PE, P
- Make a collection of found objects to be used on a poster with an ecological theme. PE, P
- Create a ceramic relief mural for the entry hall of your school. PE
- Produce a 3-dimensional form or a music composition that conveys the feeling of anger. PE
- Perform an original hand jive. PE, P
- Construct and notate chord patterns depicting 12-bar blues. PE, P

Applications Across the Curriculum

Languge Arts
- Prepare and perform a readers theatre selection for younger students, nursing home residents, or parents night. PE, P

Science
- Make a video depicting a meeting of thinkers like Gregor Mendel, Charles Darwin, J.D. Watson, Wehrner von Braun, Jules Verne, and Jacques Cousteau. Discuss their respective areas of science and the impact of each. PE, P
- Create musical instruments from natural materials which have a wide range of sounds and pitch. Perform a specific piece of music. PE, OE, P

Mathematics
- Look for examples of the golden ratio in art and architecture. Create original designs using the ratio. OE

Social Studies
- Watch selected films to observe the human experiences of the Civil Rights Movement. Create a production (e.g., musical, artistic, written) depicting the thoughts and feelings of a victim of prejudice and discrimination. PE, OE, P
- Trace the evolution of musical notation and the use of "shape notes" in Kentucky folk and church music. P

Practical Living
- Create and perform a rap for elementary students that addresses drug refusal. PE, OE
- Create and record a two minute aerobic dance routine video to be used as an instructional tool. PE, P
- Design a fashion for the year 2020. Create a news release for a classroom fashion magazine that same year. P

Vocational Education
- Select and research a health related issue and design a logo to be used in an educational campaign. PE, P
- Design letterhead for a school club or organization. PE, P
- Frame a picture. Consider the color scheme, furniture style, and proportion of the room where it will be placed. PE

Core Concept: Production

Sample High School Activities

- Interpret a historic event through movement, visual art, music, performance, and drama. PE, P
- Create and perform a chant or rap in 2/4 or 4/4 meter. PE
- Collect family stories or history. Present a video production. PE, P
- Create a visual art piece with recycled products. Give a demonstration explaining the construction. PE, OE, P
- Make a video or photographic presentation to the school board on design changes (inside or outside) needed in your school. PE, OE, P
- Create a new mascot or crest for your high school. PE, P
- Design a lighting scheme for a performance using color and intensity to create mood/atmosphere. PE, P
- Design clothing or jewelry for your age group. PE, P

Applications Across the Curriculum

Language Arts
- Describe a character from a short story using art, music, or dance. PE, P

Science
- Relate several scientific concepts in a song, poem, dance, or drama. PE, OE, P
- Trace the history of string, wood, or percussion instruments and relate construction resources used to place and time. OE, P

Mathematics
- Design wrapping paper using tessellations. PE, P
- Produce a ten-minute CD presentation of your personal top ten songs. Include oral comments. PE, OE, P

Social Studies
- Dramatize turning points in the Civil War. Video the presentation and show to community audiences. PE, OE

Practical Living
- Compile and prepare a medley of songs that convey a variety of emotions (e.g., jealousy, grief, happiness, understanding). PE, P
- Write and illustrate a children's storybook on emotions and distribute to childcare centers throughout the community. P

Vocational Education
- Produce animations via computer. PE, P
- Create a multimedia ad campaign. PE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.23: Students analyze their own and others' artistic products and performances using accepted standards.

Learning Links: Theme / Architecture / Tragedy/Comedy / Conflict / Style / Chorography / Concerto / Crafts / Reviews / Plot / Fashion / Documentary / Trend / Construction / Logic / Automobiles

Related Concepts: Observation / Reflection / Inferences / Perception / Interpretation / Criticism

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Evaluate personal artistic creations and those of others using vocabulary from music, dance, drama, and visual arts.
- Compare and contrast formal design, style, and structure within each discipline (music, dance, drama, and visual art).
- Communicate recognition of the diversity of art forms and structures in music, dance, drama, and visual arts.
- Identify and express arts concepts in music, dance, drama, and visual arts.
- Observe and explore a variety of artistic styles and forms in music, dance, drama, and visual arts.

Middle School Demonstrators

- Reflect on own and others' artwork and identify influences from a wide variety of artwork.
- Analyze own and others' work in music, dance, drama, and visual arts using appropriate concepts and terminology.
- Compare and contrast diverse art forms and structures in music, dance, drama, and visual arts.
- Observe and explore a variety of artistic styles and forms in music, dance, drama, and visual arts.

High School Demonstrators

- Evaluate own and others' artistic creations and styles.
- Analyze, evaluate, and revise own work and/or works of others in music, dance, drama, and visual arts using appropriate concepts and terminology.
- Use formal styles and structures in music, dance, drama, and visual arts to combine and organize two or more art concepts.
- Observe and explore a variety of artistic styles and forms in music, dance, drama, and visual arts.

Sample Teaching/Assessment Strategies:

Collaborative Process: Peer Tutoring • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Checklist, Observation, Self-assessment • **Graphic Organizers**: Compare/Contrast Structures, Graphic Representations • **Problem Solving**: Inquiry, Reasoning, Simulation • **Technology/Tools**: Computers • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Attend a local theatre or musical production and write a review for the school and/or local newspaper.
- Tour a local art gallery and critique a visual art form.
- Interview reporters about criteria they use in their evaluation processes.

Core Concept: Analysis of Forms

Sample Elementary Activities

- Identify the similar and different phrases in "Twinkle, Twinkle Little Star." P
- Compare and contrast artworks done by the same artist over time. OE, P
- Role-play a salesperson selling a piece of art to fellow students. Describe such things as line, shape, color and proportion. PE, OE
- Plan and make an artwork that is appropriate for a children's hospital. PE, P
- Arrange pitched instruments (e.g., bottles with water) from low to high. Use the instruments for story background using the concepts of high-low, fast-slow, and loud-soft. PE
- Produce animal-like sounds with available instruments. Use the sounds to make an audio or video tape advertisement for a zoo. PE, P
- Perform a folk dance. Draw and analyze the step patterns. PE, OE, P

Applications Across the Curriculum

Language Arts
- Choose a favorite illustrator of children's books. Write the illustrator a letter describing the reasons he/she was selected using appropriate concepts and terminology. PE, OE, P

Science
- Select an appropriate material and build a topographic model which accurately depicts a landform. PE, P

Mathematics
- Select a photograph of a person in a magazine. Cut in half and reproduce the missing half stressing symmetry and proportion. PE, P

Social Studies
- Construct models of architectural styles for homes and/or churches from various periods and cultures. PE, P

Practical Living
- Analyze architectural design of homes on a walk through a neighborhood. Form categories and create a presentation on the types of neighborhood homes. P

Vocational Education
- Create an animated production on the alphabet via computerized technology. PE, P

Core Concept: Analysis of Forms

Sample Middle School Activities

- Map/chart differences and similarities between two musical selections or visual artworks. PE
- View a scene from a movie and analyze the character development. OE, P
- Select artists from countries studied in social studies and foreign language. Create a design with music and movement portraying the artist's lifestyle and work. PE, P
- Describe your plan/idea for an artwork in your personal journal prior to designing or performing. Record the impact of the creative process on your original plan. OE, P
- Compare and contrast art pieces viewed in a medical office and a business office. OE, P
- Compare and contrast the conceptual elements (e.g., meter, tempo, dynamics, tonality) as represented in the dance segments of the *Nutcracker Suite*. OE, P

Applications Across the Curriculum

Variations on a theme: Depiction of an animal

Language Arts
- Write a detailed description of a particular attribute of a selected animal. OE

Science
- Analyze an animal using three different perspectives, such as a microscope, your eyes, binoculars. PE, OE

Mathematics
- Examine animals in the graphics of artists like M.C. Esher. Create similar graphic tesselations and modifications of a selected animal. PE,

Social Studies
- View works of artists from several different time periods who represented animals. Evaluate the reasons for differences and how those differ from your representation. PE, OE

Practical Living
- Design a survey to find out the most popular animal among your classmates. Develop an ad to appeal to that popularity. PE, OE, P

Vocational Education
- Develop an ad campaign to depict the group's most popular animal. P

Reflections

An integral part of the creative process is the exploration, analysis, and evaluation of various art forms from the fields of music, dance, drama, and the visual arts. Through the observation and exploration of a variety of artistic styles, students are able to compare and contrast the diversity of forms. Likewise, through extensive exploration of various works of art, students are able to incorporate diversity into their own products and performances.

According to von Oech, the creative process begins with exploration and investigation. Next comes the design process in which the various elements are arranged, rearranged, and finally set in place. This is followed by the phase in which the artist becomes a warrior and tries to sell his or her ideas to others by way of performance or exhibition. And finally the artist's work is judged through self-reflection and analysis.

Sources: Saul Bass and Associates—Why Man Creates
von Oech—A Kick in the Seat of the Pants

Core Concept: Analysis of Forms

Sample High School Activities

- Generate a checklist of criteria needed to review a performance or product. Use the criteria to evaluate a performance/product you have experienced. OE, P
- Write an editorial to critique your class play or favorite television program. Publish in class, school, or local newspaper. OE, P
- Write and perform a musical sketch about some event in the history of your community. PE, P
- Do an analysis of a community artist's work for the school paper. OE, P
- Analyze a magazine advertisement regarding the effect color and design has on increasing appeal. OE, P
- Attend or view a ballet; critique the appropriateness of the movements used to portray the feelings of the main characters. OE, P

Applications Across the Curriculum

Language Arts

- Read a contemporary novel written for young adults. Choose one of the following individual or group projects to present to the class:
  - Art: Create and display a piece of visual art (e.g., drawings, sculpture, collage) which depicts a specific scene.
  - Drama : Rewrite and perform a specific scene in play form (e.g., dialogue, stage directions).
  - Dance: Choreograph a dramatic moment.
  - Music: Write and perform a song depicting a specific scene.

  After all individuals and groups have presented their projects, analyze the effects that each has on the message it delivers. PE, OE, P

Science

- Establish criteria to evaluate student-generated models of the cell. OE, P
- Analyze musical instruments to find relationships to scientific principles. OE, P

Mathematics

- Use projective geometry to draw 3-dimensional objects in 2-dimensions. PE, OE, P

Social Studies

- Compare the art of two different historical periods (e.g., romanticism to realism, Spanish-American War to World War II). Prepare a presentation illustrating similarities and differences. PE, OE

Practical Living

- Perform a dance in a group and critique performance for appropriateness of music, movement sequences, and full group participation. PE, OE
- Analyze the use of art elements and principles in the design of costumes worn by actors/actresses in a play. OE

Vocational Education

- Critique a radio or television commercial for message and impact. Create a revised commercial. PE, OE

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.24:

Students have knowledge of major works of art, music, and literature and appreciate creativity and the contributions of the arts and humanities.

Learning Links: Architecture / Landscape Design / Monuments / Metaphor / Patterns / Abstraction / Poetry / Freedom / Censorship / Invention / Popular Culture / Festival / Brainstorm / Hobbies / Jazz

Related Concepts: Integrity of Form / Creativity / Artistic Freedom / Responsibility / Appreciation / Artistic Sensitivity

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Begin to formulate preferences based on the perception and reaction to the expressive qualities of music, visual arts, dance, and drama.
- Recognize and demonstrate arts concepts used to describe feelings.
- Respond to the expressive qualities of music, visual arts, dance, and drama.
- Describe reaction to artworks and performances using basic vocabulary.
- Explore a variety of art forms in music, visual arts, dance, and drama.

Middle School Demonstrators

- Discriminate and use arts concepts that develop aesthetic judgment and societal values.
- Formulate and justify personal preferences based on the perception and reaction to the expressive qualities in music, visual arts, dance, and drama.
- Compare elements within and among artworks in music, visual arts, dance, and drama.
- Demonstrate an openness and sensitivity to a variety of artworks in music, visual arts, dance, and drama.
- Experience a wide variety of art forms in music, visual arts, dance, and drama.

High School Demonstrators

- Discriminate and use arts concepts that reflect aesthetic judgment and societal values.
- Analyze reactions to artworks and performances using appropriate vocabulary.
- Demonstrate an openness and sensitivity to the role of creativity, form and craftsmanship in the evaluation of a variety of artworks.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Shadowing • **Continuous Progress Assessment**: Interviews, Observation, Self-assessment • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Debate, Inquiry, Reasoning • **Technology/Tools**: Distance Learning, Interactive Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite someone who works in advertising to discuss the use and need for art concepts in advertising.
- Attend a live theatre production and convey your reaction to the actors in person or in writing.
- Tour an art gallery, choose a favorite piece, and indicate the specific aspects that appeal to you and why.

Core Concept: Aesthetics

Sample Elementary Activities

- Create movements to music and describe the feelings you are trying to express. PE, OE
- Choose a favorite play, movie, television show, piece of music, and make a presentation on why you like it. PE
- Listen to a recording and create a visual illustration of personal feelings. PE
- Draw your favorite scene in the production after attending a play. Include it with a letter to your favorite actor/actress. P
- Make a work of visual art appropriate for display in a children's hospital ward. Defend choice of color and subject matter. PE, P

Applications Across the Curriculum

Language Arts

- Create a cartoon and write a story line. PE, P

Science

- Invent and construct a musical instrument to reproduce common sounds. PE

Mathematics

- Create designs showing rhythm, symmetry, and balance using graph paper. PE, OE, P

Social Studies

- Visit an art museum or local crafts exhibit. Explain which pieces of work you like best and why. PE, OE, P

Practical Living

- Collect information about an athletic event and create a movement sequence or dramatization of the event. Discuss the ideas and feelings communicated by the presentation. PE, P

Vocational Living

- Create a new ad for an imaginary product using images and words from existing ads. PE, P
- Research, design, and build a bluebird house. PE

Core Concept: Aesthetics

Sample Middle School Activities

- Explore the arts of a national or global historical period and communicate the relationships between and among significant architecture, dance, music, painting, and drama. OE, P
- Plan and host a Renaissance community festival. PE
- Explore the architecture of the Victorian period, find examples of the era in your own community, and make a presentation of the unique elements and their derivation. PE
- Choose an artwork you do not like. Research the artist, period, style and purpose of the work. Present your research and any changes to your opinion that occurred during your research. PE, OE, P
- Choose one element such as rhythm and find examples in all art forms. Present your findings. PE, OE
- Make a presentation about how nomadic or homeless people use the arts. PE, OE

Applications Across the Curriculum

Language Arts
- Prepare a musical program which expresses the theme of a book or play. PE, P
- Interview students who portray the major characters in a school play. Record how their understanding and portrayal of the character changed during the production. PE, OE

Science
- Based on your reaction to a scientific discovery, choose music which you think symbolizes the discovery. PE

Mathematics
- Make a stringed instrument and explain the mathematical concepts involved. Compare instruments made by classmates and explain which are most clearly related to a mathematical concept. PE, P

Social Studies
- Record local musicians performing selections. Interview them to determine the origin of the selections. Create a video or audio tape of dialogue and music. PE, P

Practical Living
- Observe a table setting and discuss how the aesthetics of the setting affect feelings and behavior. OE, P

Vocational Education
- Debate the portrayal of violence in television and movies on teenage behavior. PE, OE
- Design and build "the world's best dog house." PE

Core Concept: Aesthetics

Sample High School Activities

- Listen to selections from *Carnival of Animals.* Compare and contrast dynamics, tempo, pitch, tonality, meter, and rhythm patterns. Determine what animal/action and/or mood is depicted through the music. Communicate your reactions. PE, OE
- Conduct interviews of people in your school to ask their favorite song and reason for selecting it. Present these results using a database. PE, P
- Write your high school "last will and testament" leaving your most valued experiences in music, visual arts, dance, and drama to a younger student. PE, OE, P
- Create and display a class wall hanging. Present and explain the aesthetic forms used to express ideas and philosophy. PE, OE, P
- Create, notate, and play a pentatonic melody to accompany your own poetry. Analyze the effect of the accompaniment when the poem is presented to a selected audience. PE, P

Applications Across the Curriculum

Variations on a theme: National Anthems

Language Arts
- Compare the lyrics of national anthems from selected countries on each major continent. PE, OE

Science
- Analyze the scores of selected national anthems for similarities and differences in rhythm, melody and form. PE, P

Mathematics
- Examine the national anthems from a variety of cultures and plot the extremes of range. PE

Social Studies
- Analyze the ways a country's national anthem reflects the nation. P

Practical Living
- Produce a tape with a medley of anthems from different countries. PE

Vocational Education
- Present a selection of national anthems in the language of the country. P

Reflections

Beyond the artistic critique of formalized style and form, an aesthetic understanding and appreciation of the arts is a goal of education as students exit our schools.

To know the elements and principles of visual art, drama, music, and dance on an intellectual level is not enough; to be able to scrutinize and critique these art forms on that intellectual level is not enough either. Students need opportunities to know and understand creativity at the affective level—at the inner core of their emotions where they value the arts and humanities as necessary and pleasing parts of their lives. The aesthetic experience of the symphonies of Beethoven, the paintings of the Renaissance, or the dialogue of a Shakespeare play is quite different from knowing these art forms in an analytical and clinical way. When students know the arts as aesthetic encounters, they feel and respond to the experience personally. Over time, students formulate and justify their personal preference based on the perception and reaction to the experiences in music, art, dance, and the visual arts.

The overriding mission of this academic expectation is to expose students to the multitude of art forms. As they experience the diversity within the arts, they begin to discriminate and develop aesthetic judgment.

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.25:** **In the products they make and the performances they present, students show that they understand how time, place, and society influence the arts and humanities such as languages, literature, and history.**

Learning Links: Labor / Folk Dance / Geography / Graffiti / Celebrations / Mythology / Language(s) / Food / Traditions / Genealogy / War / Historic Sites / Religion / Hobbies / Shape Note Singing

Related Concepts: Role of the Artist / Historical Perspective / Importance of Artifacts / Geographical Perspective / Personal Perspective / Belief

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Elementary Demonstrators

- Examine the effects of time, place, and personality on art forms and performance practices.
- Demonstrate through performance or product, forms of music, visual arts, dance, and drama.
- Recognize the role of the artist in music, visual arts, dance, and drama.
- Experience a variety of art forms in music, visual arts, dance, and drama.

Middle School Demonstrators

- Communicate the influences of time, place, and personality on art forms and performance practices.
- Assess the contributions of various cultures to the expression of various art forms.
- Compare and contrast the roles of the artists in music, visual arts, dance, and drama.

High School Demonstrators

- Create performances or productions which combine elements and concepts unique to a culture's music, visual arts, dance, and drama.
- Express own personal cultural heritage through production of art forms.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Community-Based Instruction**: Field Studies, Mentoring, Shadowing • **Continuous Progress Assessment**: Interviews, Portfolio Development • **Graphic Organizers**: Compare/Contrast Structures, Graphic Representations • **Problem Solving**: Creative Problem Solving, Role-play, Simulation • **Technology/Tools**: Multimedia, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit an art museum; compare mediums used and types of pieces from the past to the present.
- Produce a photographic scrapbook showing the different influences reflected in local architecture.
- Tour a historic home and note how the time period influenced the decor of the home (e.g., type and design of cloth, color, artwork).

Core Concept: Cultural Heritage

Sample Elementary Activities

- Record different individuals from your culture singing songs from their childhood. PE, OE
- Visit a local potter and compare his/her pottery to dinnerware used in your home. Analyze the differences. OE, P
- Make hand puppets and use them to present a historic event from your local community. PE
- Learn and perform a folk dance and describe the history of the dance. PE, P
- Compare design of functional objects from diverse cultures and design one of your own. PE, OE, P

Applications Across the Curriculum

Variations on a theme: Kentucky Heritage

Language Arts
- Listen to songs about Kentucky, read the lyrics, and then write a poem celebrating Kentucky's past. PE, OE

Science
- Develop a series of maps showing Kentucky from several perspectives (e.g., topographical, geological, historical). PE, P

Mathematics
- Choose a variety of Kentucky quilting patterns and graph them, showing them as tesselations. PE

Social Studies
- Make a time line showing the relation between significant events in Kentucky history and events in the families of class members. P

Practical Living
- Role-play scenes from family life in Kentucky from the late 1700s through 1990. PE

Vocational Education
- Create a series of posters showing how occupations in Kentucky have changed from early settlement days through today. P

Reflections

To develop a deep understanding and a real sense of their cultural heritage, students must investigate the influences of time, place, personality, and society on the arts and humanities.

Meaningful activities that expose students to their cultural heritage encompass all the art forms: plays, literature, poetry, paintings, sculptures, dances, songs, foods, and native customs. Students discover their heritage through the artifacts and folk tales of their culture and translate these into personal expression through their own artwork.

Whatever you can do to import cultural heritage to your students helps them to know their roots, compare and contrast their heritage to others, and develop a keen appreciation of the legacy of past cultures.

Core Concept: Cultural Heritage

Sample Middle School Activities

- Explore the influence and impact of cultures on Kentucky music, dance, visual arts, and drama (e.g. Scottish, Irish, Vietnamese, African American, Japanese, Shaker). PE, OE, P
- Assume the role of an artist in different periods. Communicate the effect which time, place, and society have had on your products and performances. PE, OE, P
- Design masks using design patterns from different cultures. PE
- Listen to Aaron Copeland's "Appalachian Spring" and perform the song "Simple Gifts" with simple accompaniment and/or movement patterns. Indicate how place, personality, and society influence your selection process. PE, P
- Create an original performance using music, visual arts, drama, or dance that represents your personal cultural heritage. PE

Applications Across the Curriculum

Language Arts
- Write and perform a play that takes a current public figure back into a specific historical era. PE, P

Science
- Analyze and summarize how cultural heritage influenced the work of American scientists (e.g., Rachel Carson, George Washington Carver, Albert Einstein). P

Mathematics
- Chart the gross receipts of the leading box office movies throughout the years and compare to the box office receipts of Academy Award winning movies. PE, P

Social Studies
- Develop a character profile booklet showing the background and achievements of an individual from an ethnic group. PE, P
- Compile lists of popular songs from past decades. Prepare a presentation on how those songs reflected the culture of the time. PE, OE, P

Practical Living
- Research a particular dance and show it as a historical presentation depicting the dance, culture, sights, and sounds of the era. PE, P

Vocational Education
- Research and illustrate popular medical practices in other countries. Create a book on the effects of culture on medical practices. P

Core Concept: Cultural Heritage

Sample High School Activities

- Plan and present a "Madrigal Dinner." Prepare programs, make costumes, design and build sets, prepare and serve the meal, and perform vocal and instrumental selections. Discuss the way your preparations and plans differ from those of the Middle Ages. OE, PE
- Dramatize a folk tale in a modern setting. Analyze the changes that must be made. OE, PE
- Collect family/local stories, select one and present it. Enhance with music, visual art, or dance. PE, P
- Listen to *The Firebird.* Communicate the manner in which time, place, and society influenced the story. Create costumes for the characters and dramatize. Describe how the setting influenced your choice of costumes. PE, P
- Listen to the opera *Hansel and Gretel.* Perform the story in a modern style. PE, P

Applications Across the Curriculum

Language Arts

- Write a one-act play in which a family heirloom, song, story, or dance, has united a family through several generations. PE

Science

- Evaluate how the evolution of paint formulas has affected art and the preservation of artworks. PE, OE, P

Mathematics

- Research census data for information on migration patterns in your region, and show connections to changing cultural patterns (e.g., ethnic restaurants, radio stations). P

Social Studies

- Present the holiday traditions of your family. Concentrate on the cultural influences in the celebration of the holiday. PE

Practical Living

- Perform a Kentucky folk dance. Discuss the cultural contributions of early settlers in Kentucky that influenced music and dance forms. PE
- Research how cultural heritage has influenced housing designs. Compile a photographic index. PE, P

Vocational Education

- Create an arts-centered advertising campaign to promote Kentucky. Include a logo and slogan. Submit it to the Cabinet of Tourism. P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.26: **Through the arts and humanities, students recognize that although people are different, they share some common experiences and attitudes.**

Learning Links: Holidays / Literature / Games / Customs / Funerals / Jewelry / Myths / Utensils / Language(s) / Flags / Food / National Anthems / Money / Clothing / Architecture / Folk Songs / Families

Related Concepts: Recognition of and Appreciation for Difference / Commonality / Contributions of Other Cultures / Perspective / Tolerance / Universality

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate through products or performances, forms of music, visual arts, dance, and drama from diverse cultures.
- Investigate and communicate the differences and commonalities in the artistic expressions of music, visual arts, dance, and drama from diverse cultures.
- Express openness to differences and commonalties among diverse cultures.
- Experience a variety of art forms in music, visual arts, dance, and drama from diverse cultures.

Middle School Demonstrators

- Communicate beliefs, ideas, and artistic concepts through products or performances using the contributions of diverse cultures.
- Analyze artworks and performances across diverse cultures past and present.
- Research a wide variety of art forms from diverse cultures.
- Express openness and sensitivity to differences and commonalties among diverse cultures past and present.

High School Demonstrators

- Communicate the influence of the environment (e.g., social, ethnic, cultural, religious, philosophic, economic, temporal, spatial) on music, visual arts, dance, and drama from diverse cultures past and present.
- Integrate and communicate beliefs, ideas, and artistic concepts through products or performances using the contributions of diverse cultures.
- Analyze and interpret the influence of diverse cultures on personal and societal expressions and styles of art.
- Demonstrate appreciation for the artistic products and performances of diverse cultures past and present.

Sample Teaching/Assessment Strategies:

Collaborative Process: Peer Tutoring • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Checklist, Self-assessment • **Graphic Organizers**: Compare/Contrast Structures • **Problem Solving**: Case studies, Interviews • **Technology/Tools**: Distance Learning, Interactive Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Attend an arts and crafts show; note the different types of products displayed.
- Form a panel of local citizens who have visited other countries and discuss the artworks viewed in these countries.
- Visit a museum; note differences and commonalities in exhibits from different locations and time periods.

Core Concept: Cultural Diversity

Sample Elementary Activities

- Perform a play with puppets showing ways in which the school day of a child from another culture is different from your own. PE, P
- Create a display or demonstration of religious symbols from diverse cultures. PE, P
- Sing a counting song using different languages. PE
- Select a holiday and research the practices of different cultures related to it. Use your findings to prepare a visual presentation about the holiday. P, OE
- Record favorite family songs as performed by members of your family. Note differences in style, rhythm, and subject matter of songs. OE, P

Applications Across the Curriculum

Language Arts
- Listen to music of different cultures. Organize a database showing similarities and differences (volume, tempo, rhythm). PE, OE, P

Science
- Research famous scientists. Locate the scientists' homelands on a world map. Discuss how their cultures influenced their contributions to science. PE, OE

Mathematics
- Choose folk songs from diverse cultures and compare the rhythmic patterns. OE

Social Studies
- Dramatize through dance or song a celebration of a different culture. PE

Practical Living
- Research different countries and plan a world bazaar celebrating the diversity of different cultures. PE, OE, P

Vocational Education
- Organize, promote, and conduct a multicultural tasting banquet. PE

Core Concept: Cultural Diversity

Sample Middle School Activities

- Create a photo essay of the cultural diversity in your community. PE
- Listen to Mussourgsky's "Pictures at an Exhibition" and describe the elements used by the composer to depict the pictures and identify the cultures represented. PE, OE, P
- Observe weaving patterns from Eastern and Western cultures and communicate differences and commonalities in texture, design, fabric, and color. PE, P
- Explore the manner in which a single event, site, or idea has been treated by various artists from various time periods. OE, P
- Compare mother and child images by artists from various backgrounds and time periods. Develop your own artwork of a mother and child. PE, OE
- Choreograph and present a dance that uses music representative of cultures other than your own. PE, P
- Compare the original and American versions of a folk tale. Put on a skit of the original; provide a printed program explaining the differences to the audience. PE, P

Applications Across the Curriculum

Variations on a theme: Humans and the Heavens

Language Arts
- Read stories from a variety of cultures about star constellations; use a star chart to create a figure of your own. Write a legend about your figure's constellation. PE, P

Science
- Examine the rationale for events caused or influenced by tides, sunrises, sunsets, or eclipses. Compare the scientific explanation to the folk explanation of various cultures. OE

Mathematics
- Choose at least one constellation from a variety of cultures. Develop a graph of the stars in that constellation using a characteristic of your choice (e.g., distance, size). PE

Social Studies
- Using the cultures identified with other parts of this activity, make a series of maps showing locations of those cultures. PE, P

Practical Living
- Research the contributions of countries, other than the United States and former USSR, to the space program. OE, P

Vocational Education
- Design a T-shirt with illustrations or pictures of selected constellations. Identify the cultural origin of that constellaltion. PE, P

Reflections

The arts help students recognize the differences and similarities in the human experience. Through student productions, performances, and interpretations, students are able to take on the actions and emotions of others, and they are able to personify human experiences from another time and place.

To immerse students in the diverse cultural beliefs of the world, these models are helpful: engage students in empathetic expressions, provide opportunities for them to walk in another's shoes, and provide them opportunities to act and experience the feelings of another. Family activities, holidays, sports, games, theater, language, medicine, folk-tales and myths, food, flags, architecture, and clothing are all topical entries into other cultures. Through collaborative efforts across the disciplines, you can weave the cultural elements of human experience into all academic studies.

Core Concept: Cultural Diversity

Sample High School Activities

- Interview persons in the community representing different cultures and create a play showing their differences and commonalities. PE, OE
- Have students from different cultures prepare favorite family recipes. Note differences and commonalities. PE, P
- Study body language from diverse cultures. Role-play situations which show differences and commonalities. PE, P
- Develop a presentation about the major contributions of various cultures to modern music. PE
- Present dramatic sketches of myths and folk tales of diverse cultures. PE, P

Applications Across the Curriculum

Language Arts

- Design a culture for Jupiter. Describe how a visitor from Jupiter will deal with current cultural practices in your state or community. PE

Science

- Gather, exchange, and correlate data on an environmental issue with a student or class in another country. PE, OE, P
- Develop a multimedia presentation to show the relationship of teenage diets to the health of teenagers in different geographic regions. PE, P

Mathematics

- Examine music from a variety of cultures in terms of prevalent ratios of tone, beat, volume. OE, P

Social Studies

- Compare the top 10 songs in the nation with those in foreign countries for a given period of time. Make inferences about cultural diversity and similarities. P

Practical Living

- Produce a video or audio tape of lullabies from different countries. Analyze for similarities and differences and the way in which the lullabies relate to the human experience. PE

Vocational Education

- Investigate a product from another culture. Determine how it could be marketed in the United States (e.g., Nutella Spread from France). Present marketing strategies for the United States. PE, OE, P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.27: **Students recognize and understand the similarities and differences among languages.**

Learning Links: Anagram / Dialect / Poetry / Sign Language / Theatre / Definitions / Translations / Braille / Rap / Rhyme / Slang / Lyrics / Esperanto / Etymology / Body Language / Code / Fonts / Calligraphy / Voice Print

Related Concepts: Form and Structure of Languages / Diversity of Languages and Culture / Cross-fertilization of Languages

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Communicate basic ideas and feelings using stock phrases from various languages.
- Investigate the derivation of words, concepts, and symbols from various languages.
- Investigate similarities and differences among languages.
- Listen to and observe a variety of languages.

Middle School Demonstrators

- Communicate simple ideas, feelings, or phrases using various languages.
- Analyze the advantages and disadvantages of linguistic translation.
- Compare similarities and differences among languages.
- Analyze basic forms, structures, and concepts across a variety of languages.
- Explore the derivation of groups of words, concepts, and symbols across a variety of languages.

High School Demonstrators

- Model the similarities and differences in languages among similar and diverse cultures.
- Evaluate the effects of time, place, politics, media, and geography on languages and language development and dispersal.
- Apply observations of other languages to native language.
- Recognize other languages spoken, written, and/or signed.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Checklist, Portfolio Development, Self-assessment • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Interviews, Debates, Creative Problem Solving, Formulating Models, Role-play, Simulation • **Technology/Tools**: Distance Learning, Interactive Video, Computers, Multimedia, Puppets, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Interview someone from another country to discuss differences between his/her native language and English.
- Visit an ethnic restaurant and report on types and names of foods served.
- Invite a local citizen who knows sign language to class for a demonstration and explanation of differences among American Sign Language, other signed languages, and English.

Core Concept: Language

Sample Elementary Activities

- Explore other alphabets and pictographs. Prepare an abecedary of various alphabets. PE, P
- Investigate and map the derivation of words, concepts, and symbols. PE, P
- Use the *Oxford English Dictionary* to trace word history. PE
- Invent a code using geometric shapes and symbols. Write messages for classmates to decode. PE, P

Applications Across the Curriculum

Language Arts
- Collect advertisements in several languages from magazines and newspapers. Generate a list of the words used most frequently to persuade. P

Science
- Use pictures or symbols to create a set of directions for a science activity. PE, OE

Mathematics
- Graph the frequency distribution of letters of the alphabet occurring in written passages from various languages. PE, P

Social Studies
- Locate places of origin of surnames of students in the class. PE

Practical Living
- Interpret body language (e.g., crossing arms, eye contact, and/or tapping foot) which occurs during conflicts. PE, OE
- Prepare a pictorial dictionary depicting frequently used foreign language food phrases (e.g., a la mode). PE, P

Vocational Education
- Translate and print a poem in Braille. PE

Core Concept: Language

Sample Middle School Activities ⬓

- Make wall charts that summarize the forms, structures, and concepts of a variety of languages. PE
- Compare different translations of the same story (e.g., "The Three Little Pigs"). PE, OE, P
- Create a slang dictionary. PE
- Create a 3-dimensional form of lettering using 1 and 2-point perspective. PE, P

Applications Across the Curriculum

Language Arts
- Research dialect and vocabulary differences from regions in the state/country. In small groups, write and perform a skit which includes conversation from each dialect. PE

Science
- Use an international electronic bulletin board to compile data on a common scientific research project. P

Mathematics
- Investigate the proportions of various computer font designs. Design your own using precise proportions. PE, P

Social Studies
- Design a chart (e.g., language tree) that shows the evolvement of modern language forms from the original Indo-European language. Explain the process of evolvement. PE, P

Practical Living
- Investigate the use of foreign language terms in advertisements. PE, OE, P

Vocational Education
- Create a set of visual cue cards with mnemonic clues to help learn Latin legal and medical terms. OE, P

Core Concept: Language

Sample High School Activities

- Observe and record speech patterns of diverse social groups, and report the results. PE, P
- Examine a foreign language message which uses Western characters. With the help of a few linguistic cues, play the role of linguist and decode the message and explain reasoning. PE
- Help a "foreign guest" by identifying and explaining figurative and idiomatic uses of words or phrases in American texts or recorded conversations. PE, P

Applications Across the Curriculum

Variations on a theme: Emotions

Language Arts
- Given a set of love letters in translation, read and compare for basic components of form. PE

Science
- Examine the changes in English love poems from Chaucer's day through the present. Evaluate the factors which combined to produce this evolution and make predictions about future change. OE

Mathematics
- Represent the number of entries for "love," "hate," "fear," and "anger" in foreign language dictionaries using a variety of computer-generated graphics. PE, P

Social Studies
- Consult a number of foreign language dictionaries for entries under "love," "hate," "fear," and "anger." Draw conclusions about the significance of the emotions to the speakers of the language based on the number of entries. P

Practical Living
- Research the effects on personal health that can be caused by "love", "hate", "fear", and "anger." OE

Vocational Education
- Survey a variety of media to determine policies on language use pertaining to "emotions." PE

Reflections

Language is the basis for our communication with others. Students who understand the form and structure of language can use this knowledge to improve their relationships with others and enhance their own sense of well-being. They can also use the powerful tool of language in practical matters such as negotiations in business or relating personal needs to a family member.

Just as technology becomes a tool with which students manifest their thoughts and feelings, so too is language a tool—the ultimate tool in understanding others and helping others to understand us. To immerse students in the basics of language, they need consistent and intense opportunities to apply their observations about the structure of the written and spoken word. These opportunities can take many forms, from working with codes to comparisons of foreign words and phrases with English. They might manifest themselves in exploratory language experiences or the more intensive study of a highly structured language such as Latin. These learning episodes include all the traditional tools of verbal-linguistic intelligence (e.g., presenting, deciphering, translating, and comprehending) but can also be expanded to include other intelligences as well.

Students need opportunities to explore the sound of language and the look of written words. They need application opportunities to use the tool of language in as many demonstrative tasks as possible.

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.28: Students understand and communicate in a second language.

Learning Links: Fluency / Translation / United Nations / Dialect / Diplomacy / Multinationals / Slang / Derivation / Movies / Interdependence / Travel / Trade / Machine Translation

Related Concepts: Listening / Speaking / Writing / Reading / Culture

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Communicate basic ideas in a second language.
- Respond to a discourse on a specific topic when listening to a second language.
- Recognize basic ideas from text written in a second language.
- Practice writing simple messages using a second language.
- Listen to and imitate a variety of languages.
- Identify some important people, holidays, and geographic areas.

Middle School Demonstrators

- Communicate opinions on a specific topic in a second language.
- Listen to and interpret the main ideas of a discourse in a second language.
- Communicate simple ideas in writing in a second language.
- Read and interpret brief passages written in a second language.
- Identify some important dates, events, and people, and discuss their significance.

High School Demonstrators

- Communicate complex ideas in real-life situations in a second language.
- Analyze and respond to topics in an extended discourse offered by speakers using native-like discourse strategies in a second language.
- Communicate complex ideas in writing in a second language.
- Analyze written text and make appropriate inferences in a second language.
- Handle routine social situations.
- Discuss the significance of the geography, history, and political contributions of the target culture.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning •**Continuous Progress Assessment**: Checklist, Portfolio Development, Self-assessment • **Graphic Organizers**: Graphic Representations • **Problem Solving**: Interviews, Debates, Creative Problem Solving, Formulating Models, Role-play, Simulation • **Technology/Tools**: Distance Learning, Interactive Video, Computers, Multimedia, Puppets, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Access public and private library collections of foreign language film, video, and print material.
- Interview local foreign language speakers, including teachers and students, Peace Corp volunteers, missionaries, and migrant workers.
- Identify and visit local businesses (e.g., import stores, travel agencies, and restaurants) that have foreign clients.
- Find sources for foreign videos, cookbooks, and objects such as money, advertisements, and brochures.

Core Concept: Second Language Proficiency

Sample Elementary Activities

- Draw and put foreign language labels on the floor plan of your house or apartment. Include one sentence about each room. PE, P
- Play "Follow the leader" giving all commands in the target language. Use different formats (e.g., game, song) to do this. PE
- Read known stories (e.g., "The Little Red Hen") aloud in the target language. PE
- Correspond with a pen pal in a foreign country where the target language is spoken. Write letters in your own language and read letters in the target language. PE, OE, P
- Sing songs in the target language. PE
- Interview a person who speaks the target language. PE, OE
- Learn a song in American Sign Language and perform the song for an audience. PE

Applications Across the Curriculum

Variations on a theme: Songs or Stories

Language Arts
- Listen to a variety of songs in the target language. PE, OE

Science
- Select a number of songs with the same theme in the target language. PE, OE, P

Mathematics
- Compare the rhythm to the beat of the selected songs in the target language. PE, P

Social Studies
- Make costumes representing the country or countries where the songs of the target language are sung. Wear the costume during the performance. PE, OE

Practical Living
- Using the target language, perform a selection of songs alone, and with a group. PE

Vocational Education
- Create an invitation and program of the songs in the target language for a performance. PE

Reflections

There is an unfortunate joke often heard abroad. "What do you call someone who speaks three languages? Trilingual! What do you call someone who speaks two languages? Bilingual! What do you call someone who speaks one language? American!" It is sad, but true, that students around the globe are required to be well-versed in several languages, while all too frequently students in America's schools are fluent in only one—English.

To target understanding and communicating in a second language as an academic expectation signals a call for change; change from the study of foreign language as an honors elective, to the need for proficiency in a second language as a required element in the education of every student.

The world is a community. As members of a leading society in the Western world, it is only prudent that all students develop the ability to communicate in a second language.

With competence and proficiency in a second language, every student is more fully prepared to be a citizen of the global village. Learning another language is not merely an enhancement to a well-rounded education. Rather, it is a prerequisite for every student as they begin to better understand the world around them.

Core Concept: Second Language Proficiency

Sample Middle School Activities

Each of the following activities should be done using the target language.

- Role-play a situation in which you show a foreign student around the school. Answer questions classmates have researched regarding differences in facilities. PE
- Draw names of famous people or literary characters. Introduce that person to the class without using the person's name. Classmates should try to guess the identity. PE
- Develop selection criteria for determining the host families for an international exchange program. Develop a questionnaire for the program. OE, PE
- Compare the original and American versions of folk tale(s). Put on a skit of the original version; provide a printed program to explain the differences to the audience. P
- Work in groups role-playing members of a foreign family planning a vacation. Offer reasons for a different vacation destination. PE
- Watch a foreign film and summarize the plot orally or in writing. PE, P
- Choose a favorite video and produce a "dubbed" clip of one scene. Lay the soundtrack over the picture and present for the class. PE, P

Applications Across the Curriculum

Background research and materials for the following should be in the target language. Presentations may be in English in classes where students have studied other foreign languages.

Language Arts

- Select a poem which deals with a topic being covered in another class. Read the poem to the class and have classmates discuss the connections to the subject being discussed. PE, OE

Science

- Use foreign language materials to study science concepts. P
- Develop a message in a foreign language that might be carried by a space probe traveling outside the solar system. Indicate some vital information about the origin of the probe. PE, OE, P

Mathematics

- Based on the current exchange rate, set up a travel budget for a trip in a foreign country. Role-play situations where currency is exchanged (e.g., eating, shopping). PE, P

Social Studies

- Choose and research three "important" people from a foreign culture and communicate your reasons for choosing them. PE, OE

Practical Living

- Write a news report and prepare a broadcast for your class. PE, P
- Teach or play a sport with classmates. PE
- Develop a game and describe it to other class members. P

Vocational Education

- Use recipes written in the target language to prepare a meal. PE

Core Concept: Second Language Proficiency

Sample High School Activities

Each of the following activities should be done using the target language.

- Prepare a written summary of television and radio news from an assigned country. OE, P
- Compare a U.S. History text and a target language world history text. Give an oral summary of the main differences. OE, PE
- Listen to a famous speech and then give a summary of the speech either in writing or orally. PE, OE, P
- Read a passage of a literary work (prose or poetry) and express your feelings about the piece. Include likes and dislikes and the memories evoked. PE, OE
- Select and research an artist in preparation for an oral report to the class. Include examples of the artist's work in the report. PE, P
- By using a modem and communications software, communicate with others around the globe who are studying your second language. PE

Applications Across the Curriculum

Background research and materials for the following should be in the target language. Presentations may be in English in classes where students have studied other foreign languages.

Language Arts
- Subscribe to a target language newspaper. Note the differences and similarities between that paper's presentation of specific national and world events and the presentation offered by a Kentucky daily newspaper. PE, OE, P

Science
- Write a review of a science investigation. PE, P

Mathematics
- Use target language to solve real-world mathematics problems. PE, OE, P

Social Studies
- Develop a travel guide for another country. P

Practical Living
- Write a review for a pen pal in another country of an arts event you attended. PE, OE, P

Vocational Education
- Research and prepare a presentation on foreign country careers for Americans. PE, P

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Practical Living Studies

Practical Living Studies

"...all youth are caught in a vortex of new risks. They face risks that were almost unknown to their parents and grandparents, and face those risks at an early age."

***Turning Points: Preparing American Youth for the 21st Century*, (22)**

Health-related issues permeate today's society. People are more health conscious; yet, American children are more at risk than ever before. The academic expectations in practical living studies address all aspects of wellness and include development of health habits and behaviors that will affect students throughout their lives. Although practical living studies includes health education, home economics, and physical education, instructional/assessment activities which help students achieve these outcomes should be integrated across the disciplines, beginning in primary school.

Optimal physical, mental, social, and emotional development is necessary for lifelong health and learning. The physical condition of individuals affects their mental and emotional health and vice versa; therefore, these facets of health cannot be treated separately, and emphasis cannot be placed on one at the exclusion of the other.

Wellness education must include study of personal health, nutrition, disease prevention and control, family life and parenting, consumerism, HIV/AIDS/STDs, substance abuse, stress manage-

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Bruner Middle School is developing an interdisciplinary unit based on a "Systems and Interactions" theme. A team of teachers met to plan instructional units. The practical living studies teachers decided to focus on the middle school demonstrator, "Evaluate the effects of subsystems and the components of a system." They let their students brainstorm ideas for the activities in which they had an interest.

Mr. Green's health education class planned to monitor the body systems by doing personal health status analysis and graphing the results.

Having viewed a video on fad diets, Ms. Thompson's home economics class became interested in investigating how nutrition and eating habits affect the body systems.

Mrs. Edward's physical education class decided to plan, develop, and participate in an aerobic exercise program after studying the impact of physical fitness on the body systems.

The three classes decided to do research and develop a brochure for distribution to the student body. The brochure would address aspects of healthy lifestyle habits that enhance health status and well-being.

ment, self-esteem, health systems and resources, and accident prevention and safety. Also included are psychomotor skills and physical fitness patterns of behavior that can be sustained throughout life. Students need an understanding of how their body systems function and an appreciation for the human body as a marvelous "machine" that reacts positively or negatively to choices of consumption, behavior, and activity. They need to recognize and accept personal responsibility for their own health and to appreciate that their health is intertwined with that of the community and world. In a world where high-risk options abound, schools cannot consciously neglect the health-related issues with which students are confronted daily.

Education in family life and parenting, substance abuse and violence prevention, stress management and conflict resolution, resource management and consumer education, and social skill development can have a major influence on mental and emotional wellness. Despite the emerging diversity in family structure, function, and lifestyle, the family remains the single most important factor in the development and self-understanding of the individual. Parents provide their children with models of parenting behaviors; in dysfunctional families these models are frequently not conducive to mental and emotional wellness. Students must be given opportunities to learn constructive family life and parenting skills, including an appreciation of the way family members help each other, and the value of the feeling of belonging in a family.

Students need to master the processes necessary in making rational consumer and resource-management decisions which influence quality of life for themselves and others. They need skills which enable them to manage stress and crisis, develop a sense of purpose in life, and maintain healthy self-esteem. Students also need to master social skills which enable them to protect their rights, bond with others appropriately, and contribute to others.

In an increasingly global society, students must recognize and appreciate the influence and responsibility they have in contributing to the health and well-being of their community and society. Health is a global concern; the behavior of individuals in one part of the world can potentially influence the environment, resources, and welfare of all.

Maintaining physical, mental, social, and emotional wellness is about making responsible choices that protect the well-being of the individual, family, and the world community. These choices include avoiding high-risk health behaviors, contributing to the family and society, and making healthy transitions into responsible adulthood. The practical living studies academic expectations when taught throughout the curriculum, P-12, are designed to develop in students those skills, habits and behaviors that will contribute to a lifetime of physical, mental, social, and emotional wellness.

Carnegie Council on Adolescent Development. *Turning Points: Preparing American Youth for the 21st Century*. New York, NY: Carnegie Corporation, 1989: 22.

Students from Taylor County High School compare nutritional information found on food labels. **Photo by Rick McComb.**

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.29:** **Students demonstrate skills that promote individual well-being and healthy family relationships.**

Learning Links: Dating/Marriage / Pregnancy / Birth Control / HIV/AIDS/STDs / Death and Grief / Divorce / Rape / Suicide / Abuse / Discipline / Self-control / Adoption / Baby-sitting / Day Care / Geriatrics

Related Concepts: Communication Skills / Rights & Responsibilities in Interpersonal Relationships / Parenting / Conflict Resolution / Child Development / Sexuality / Human Life Cycle / Family Crisis / Family Violence / Personal Safety / Abstinence Skills

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Determine situations that are abusive or unsafe.
- Demonstrate positive ways to resolve conflicts.
- Create solutions to problems that occur in family relationships.
- Examine different types of families and changes within families.
- Demonstrate appropriate ways to express feelings.
- Recognize rights and responsibilities in family relationships.
- Determine roles of family members.

Middle School Demonstrators

- Evaluate constructive and destructive family relationships in different types of families.
- Distinguish between rights and responsibilities in family relationships.
- Describe changes (e.g., physical, emotional, social) that occur during adolescence.
- Analyze effective practices which prevent Sexually Transmitted Diseases (STDs).
- Choose strategies for responding to sexual abuse and family violences.

High School Demonstrators

- Analyze lifestyle decisions that promote healthy family living.
- Apply skills that promote healthy relationships among family and friends.
- Analyze personal rights and responsibilities in family relationships.
- Evaluate the impact of sexual choices on the health and well-being of self and others.
- Analyze the impact of family planning on individual, family, and society.
- Assess parenting skills that lead to a nurturing family life.
- Interpret the impact of changes throughout the life cycle.
- Investigate protective strategies for dealing with sexual abuse and family violence.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Self-assessment • **Problem Solving:** Inquiry, Investigation, Simulation, Role-play, Interview • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a lawyer, police officer, or spouse abuse representative to discuss dating and/or domestic violence.
- Visit one or more childcare centers to observe developmentally appropriate activities.
- Invite a community member from another culture (e.g., foreign exchange student) to visit the class and talk about family in his/her country of origin.
- Invite a social services or Family and Youth Service Center representative to class to discuss community agencies that offer assistance or protection to families or children.

Core Concept: Family Life and Parenting

Sample Elementary Activities

- Use a word processor to draft, revise, and finalize a story which portrays a real-life conflict; include ways to resolve the problem. Discuss the effectiveness of the solutions. OE, P
- Brainstorm household chores/jobs. Chart the tasks each family member performs. OE
- Role-play ways to express personal feelings experienced in given situations. PE
- Make or draw a house in which your family members are placed. Display the house and discuss the similarities and differences with other households to examine types of families. OE
- Read a book/article where people are in safe and unsafe situations. List actions that have led to both the safe and unsafe circumstances. Compare this to situations you might face. Determine what actions you could take. P
- Create and perform a skit that demonstrates rights and responsibilities of family members. OE
- Make a chart which lists likes and dislikes of family members. Analyze the lists to predict why certain problems occur in families. PE, OE

Applications Across the Curriculum

Language Arts

- Read stories about family relationships. Web the responsibilities of the family members. Create your own book about family members and their responsibilities toward other family members. P

Science

- Prepare a graphic representation (e.g., circle graphs, line graphs, histograms, charts) to describe survey information from your classmates regarding roles and responsibilities of family members. Compare it to a honeybee society. P

Mathematics

- Consider several household chores for which you feel you should be responsible and the allowance you think would be fair for each activity. Identify the basis for establishing the rate of allowance. OE

Social Studies

- Role-play family roles in agrarian and urban societies. PE

Arts and Humanities

- Create a soft sculpture of someone special to you. Promote a family life week during which the soft sculptures will be displayed. PE, P

Vocational Education

- Determine solutions to family-life problems resulting from a family crisis or change (e.g., illness, move, new baby, handicapped or elderly family member) by using problem-solving techniques. PE, OE
- Role-play solutions to sibling conflicts. Identify the consequences of each solution and determine if there are preferred actions. PE

Core Concept: Family Life and Parenting

Sample Middle School Activities

- Simulate the responsibilities of parenthood by caring for an inanimate object (e.g., egg, two pound bag of flour) for an extended period of time and relate how being a parent would change the lifestyle of an adolescent. PE, P
- Write, perform, and critique a skit which communicates effective refusal skills . PE, OE, P
- Generate and role-play scenarios where adolescent issues/concerns (e.g., gossip, peer pressure, sexual relationships, sexual disease, exploitation) are resolved. P
- Use desktop publishing to write articles on blended families for the school newspaper. Include ways (e.g., communication, distribution of chores) to ease the transition. OE, P
- View a television program and determine the roles and responsibilities of each family member. Discuss and analyze why certain problems occur and how they can be resolved. OE, P
- Research community agencies that offer assistance or protection to families or children. Make a booklet that identifies the agencies and include services, addresses, and phone numbers. OE, P
- Gather information on prevention of Sexually Transmitted Diseases (STDs). Evaluate the accuracy and credibility of the data. PE, OE

Applications Across the Curriculum

Variations on a theme: Home Safety

Language Arts
- Write a play about home accidents and how to avoid them. PE, OE

Science
- Inventory the cleaning and painting supplies in your home. Assess current storage facilities for the products and design an alternative storage plan, if needed. PE

Mathematics
- Research the type and number of in-home accidents and design a plan to eliminate those risks in your home. PE, OE

Social Studies
- Research the history of first-aid procedures; create a visual on how they have changed (e.g., seizures, water safety, choking). P

Arts and Humanities
- Design posters for home-safety awareness and display in the community. PE
- Videotape the home-accident play and share with a class of elementary students. PE

Vocational Education
- Prepare a baby-sitter's manual emphasizing home safety and dealing with emergencies. PE, OE, P

Reflections

In a world where the rapid rate of change creates unstable factors affecting society from its inner nucleus to its outer core, the family is most at risk. Some futurists describe the family of today as the "shattered family." The increasing rate of divorce, corporate transfers, single parenthood, blended families, and aging parents is markedly changing the family unit.

Individuals go into parenting with little or no training and often with limited idea of what is expected of them. The seriousness of this condition is compounded if the parents are teenagers who have not yet assumed responsibility for their own lives.

Students need instruction in family life and parenting skills if they are to provide their children with a family infrastructure that supports positive growth and development. Family life skills is an academic expectation that dictates a fully articulated curriculum and must be threaded throughout the transformed academic curriculum.

Source: Toffler—Future Shock

Core Concept: Family Life and Parenting

Sample High School Activities

- Create an exhibit which focuses on lifestyles that promote healthy family living; display the exhibit in the local community. PE, P
- Brainstorm, by working in small groups, possible solutions to problems or situations involving family roles and responsibilities; select the most viable and defend the solution(s). OE, P
- Design a poster on the physical, social, and emotional risks of becoming sexually active. Describe how the life of a young woman or man might change. PE, OE, P
- View laser-disk technology dealing with teenage sexuality and discuss social concerns. OE, P
- Write a manual for middle school students communicating effective refusal skills. P
- Collect data which show the connection between occupations and family relationships. Develop a presentation which shows how career choices may affect family life styles (e.g., location of job, salary). PE
- Examine how the aging of family members affects relationships in the family. Write a piece which discusses ways to deal with these life changes. P
- Volunteer to work with a community agency that addresses family violence. PE, OE, P

Applications Across the Curriculum

Language Arts
- Interview a cross section of single parents and their children for a series of articles for your school newspaper. Analyze effects of social and economic status, gender, age, cultural and/or ethnic heritage, educational level, and other factors on each parent-child relationship. Discuss coping mechanisms for single parents and their children, benefits and liabilities of living with or being a single parent, and other information of interest to the readers of your series. PE, P

Science
- Evaluate the reliability of the means (e.g., physical characteristics, personality traits, blood types, DNA mapping) by which paternity is determined. OE
- Research the effects of a chronic illness on familial relationships. Create and present a multimedia report of your findings. P

Mathematics
- Investigate the financial impact of divorce on a family with children ages 10 and 16 with two working parents. P

Social Studies
- Research family life in America from colonial times to the present. Using a multimedia presentation, show reasons changes have occurred in family structure. PE, P

Arts and Humanities
- Create and perform an improvisation where two family members must resolve a real-life, family issue/problem. PE
- Create individual designs for a bulletin board depicting the impact of changes throughout the life cycle. Select the designs or "merged" design to be displayed in the library. PE

Vocational Education
- Plan and conduct activities (e.g., recreational, educational) for the elderly. Create and publish an article on your experience. PE, OE
- Research activities which address the social, emotional, mental, and physical needs of a four-year old. Plan and implement a variety of appropriate activities in a nursery school program. PE, OE, P
- Write an article for the school newspaper regarding the risks of premarital sex. P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.30: **Students evaluate consumer products and services and make effective consumer decisions.**

Learning Links: Banking / Advertising / Taxes / Food/Shelter/Clothing / Wants/Needs / Conservation / Money Management / Ecology / Entertainment / Recycling / Credit

Related Concepts: Financial Institutions / Consumer Skills / Resource/Environmental Management / Budgeting / Consumer Services/Products / Personal Finance

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Evaluate consumer decisions for environmental impact.
- Analyze and use consumer information.
- Examine influences on consumer selections.
- Examine the key points from a message (e.g., advertisement).
- Recognize products and services that individual families consume.
- Describe products and services of personal concern and preference.

- Evaluate personal consumer practices for environmental impact.
- Make consumer decisions. Defend selections.
- Analyze advertisements for consumer approaches and accuracy of information.
- Develop strategies for managing personal resources.

- Utilize consumer skills in real-life situations.
- Evaluate consumer information, rights, and responsibilities.
- Access and use available consumer and personal services.
- Develop and use strategies for managing resources (e.g., personal, family, environmental).
- Determine strategies for making informed consumer decisions.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Self-assessment, Portfolio Development • **Problem Solving**: Case Studies, Role-play, Simulations • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a resource person (e.g., Better Business Bureau, chamber of commerce) to discuss fraud and misleading information offered to consumers.
- Invite a resource person (e.g., representative of a power company, Cooperative Extension Service or Home Builders Association) to discuss energy conservation as it relates to consumer decisions.
- Visit a local bank and a money machine to observe the functions and services of each. Ask the banker to describe the responsibilities of the user.

Core Concept: Consumerism

Sample Elementary Activities

- Design and operate a simulated shopping center which includes a bank, grocery, pet shop, and sporting goods and music stores. Write a story about your experiences. PE, P
- Bury a potato, paper container, plastic bottle, and an aluminium can; record quarterly the biodegradable status. Use the results of the study to determine the environmental impact of purchasing habits. PE
- Choose a product that meets a personal need or want. Examine and present the reasons (e.g., purpose, cost, availability, dependability, advertising) you would buy this product. OE, P
- Identify your favorite commercial and why you like it. Describe characteristics of the product. Identify techniques advertisers use to convince you to buy the product. Decide whether or not you will buy the product. Create a commercial to sell a product. PE, OE, P
- Make a map or rebus-story tracing the consumer chain of a particular product. OE, P
- Make a collage of labels from items in your home. PE

Applications Across the Curriculum

Language Arts

- Determine, as a class, an item for class purchase. Design and implement a plan to earn money for the purchase. P

Science

- Calculate the money saved in one year if a pack-a-day smoker stopped smoking. Plan multiple experiences for the family that could be financed by the money saved. PE

Mathematics

- Estimate the amount of water you personally use in one day, one week, one year. Suggest ways in which you could save water. OE, P

Social Studies

- Identify classroom supply needs over a semester. In cooperative learning groups, examine school supply catalogs and suggest the most efficient and practical use of the available money. P

Arts and Humanities

- Rewrite an advertisement to convey what you think is the "truth" about a product you have used that did not live up to its advertisement. PE, OE, P

Vocational Education

- Select items for a first aid kit for the classroom. Comparison shop for items charting price, size, and amount; determine the best buy. P
- Evaluate a household product using a list of criteria agreed upon as a team. OE, P
- Research and compile a list of consumer services available to people in the community. P

Core Concept: Consumerism

Sample Middle School Activities

- Role-play a process for returning a defective product. P
- Create a database of daily personal water usage. Develop a plan to conserve water. P
- Compare the cost, time, and skills needed for preparing a dinner at home and ordering a restaurant meal. Use technology to record and illustrate results. OE
- Analyze print advertising for misleading and/or fraudulent information. Create displays that illustrate your findings. PE, OE
- Investigate buying trends of young people. Visit local stores and develop a comparison sheet of prices and quality of several selected items that adolescents purchase. PE

Applications Across the Curriculum

Language
- Develop a plan to save money for an expensive item you want to purchase. P

Science
- Plan a shopping list using coupons to get the lowest prices possible for the most nutritious foods. P
- Use a nutrition table to plan meals for a camping expedition which are well balanced and within a given budget . PE

Mathematics
- Compare the cost of purchasing specific items by cash versus credit. Develop visual representation of the result. PE

Social Studies
- Participate in a simulation of command and free market economies, indicating the availability of goods and services of each. PE
- Collect reports on the living standards for the average citizen in eastern and western European countries. Analyze their economic systems and relate to differences in consumer goods availability. OE, P

Arts and Humanities
- Invent an original product that can be marketed; design an advertisement for television incorporating graphics, music, and movement; communicate the functional uses and cost benefits of the product. OE, P

Vocational Education
- Evaluate food advertisements for validity of health claims. OE
- Practice common banking transactions (e.g., deposits, check writing, keeping a register, and reconciling a bank statement) using materials collected from the bank. PE
- Prepare and deliver a "best-buy" presentation supporting the purchase of a specific stereo. PE

Core Concept: Consumerism

Sample High School Activities

- Develop an itinerary and budget for a trip to a national park using information obtained from representatives of various agencies (e.g., travel agencies, insurance companies, house sitting services, kennels, car rental firms). P
- Develop and implement an entertainment spending plan based on monthly personal income. OE
- Critique television advertising strategies to determine the persuasive techniques used. OE, P
- Create and distribute brochures which illustrate environmentally sound consumer alternatives for using disposable items (e.g., paper, disposable diapers, styrafoam products). P
- Investigate consumer journals and use comparative shopping techniques to select the best buy of a CD player. Justify your selection. PE, OE, P
- Investigate several types of health insurance. Prepare charts listing coverage, exemptions, and pros and cons for each policy. Analyze results for best purchase. OE, P
- Design the most energy-efficient and economical heating and cooling plan for a new home being built in your community. Consider local availability of materials as well as the local climate. OE, P

Applications Across the Curriculum

Variations on a theme: Advertisements and Advertising

Language Arts
- Analyze a variety of advertisements for subliminal messages. OE, P

Science
- Research scientific accuracy of claims made in advertising. PE, OE, P

Mathematics
- Analyze the validity of the statement "Figures don't lie, but liars can figure." Apply to a variety of advertisements. OE, P

Social Studies
- Collect advertisements for a product which are aimed at different consumer groups. Compile in a portfolio. P

Arts and Humanities
- Re-create a variety of advertisements in different media. Analyze the similarities and differences with the original advertisements and the impact on the marketing of the product. PE, OE, P

Vocational Education
- Create an advertisement for a specific career in which you are interested. PE

Reflections

In terms of availability of goods, we are often confronted with option-overload. Think about the choices that present themselves on a daily basis. The options overwhelm us as we try to select the appropriate, "just right" gym shoe from the hundreds of models and styles available; try to find the "best" long distance phone service; or try to choose a car. As consumers of a multitude of goods and services, schools must equip students with the skills for effective consumer decision making. They must provide the knowledge base and experiences for practical application of consumer rights and responsibilities. The concept of consumerism is a rich and fertile theme that sparks a wealth of ideas across curricular boundaries.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.31:

Students demonstrate the knowledge and skills they need to remain physically healthy and to accept responsibility for their own physical well-being.

Learning Links: Self-discipline / Genetics / Alcoholism/Drugs / Aging / Environment / Health Care / Nutrition / Safety and First Aid / Food Preparation / Stress / HIV/AIDS/STDs / Personal Hygiene

Related Concepts: Nutritional Practices / Physical Fitness / Personal Health Habits / Disease Prevention and Control / Self-assessment / Safety and Emergency Measures / Lifestyles / Stress Management

Elementary Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Evaluate and select actions which can enhance growth, development, and wellness.
- Identify preventative safety procedures for the home, school, and community.
- Develop awareness of the interrelatedness of body functions and the impact of lifestyle choices on body systems.
- Explore measures for preventing and controlling disease.
- Investigate nutritional practices which enhance health.

Middle School Demonstrators

- Demonstrate basic physiological principles of exercise (e.g., intensity, duration, frequency).
- Evaluate dietary practices.
- Select behaviors and make lifestyle choices to prevent or minimize the risk of disease.
- Recognize the benefits of self-assessment of health status.
- Describe the interrelationships of and physiological changes in body systems.
- Analyze procedures for emergency situations.
- Apply preventative safety measures for the home, school, and community.

High School Demonstrators

- Apply wellness concepts to health maintenance.
- Assess and design strategies for improving and monitoring health-related physical fitness (cardiovascular endurance, muscular strength and endurance, flexibility, body composition).
- Apply nutritional practices which promote wellness.
- Select behaviors to prevent or minimize the risk of disease.
- Analyze impact of personal behavior on body systems.
- Demonstrate first-aid and safety procedures.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies • **Continuous Progress Assessment**: Self-assessment • **Graphic Organizers**: Mapping/Webbing, Matrix, Graphic Representations • **Problem Solving**: Role-play, Interview, Creative Problem Solving, Future Problem Solving • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Visit community hospitals/clinics to learn about and assess services for disease control and prevention.
- Invite a resource person to explain wellness behaviors and give examples of self-monitoring.
- Invite a nutritionist, registered dietitian, or home economist to speak on nutrition, healthy diet, or nutritious snack choices.
- Visit a local fitness center or YMCA to practice relaxation exercises with an instructor.
- Invite a pharmacist to class to discuss healing with drugs. Invite a local person informed about the medicinal qualities of plants to discuss healing with home remedies.

Core Concept: Physical Wellness

Sample Elementary Activities

- Develop a physical fitness, self-improvement plan identifying areas of weakness. Plan simple, realistic goals for improvement; keep a progress chart and incorporate healthy rewards. P
- Design a balanced menu for one week including breakfast, lunch, dinner, and snacks. Prepare one meal from the menu. PE
- Record, in a journal or log, lifestyle habits which impact immediate and long-range health. P
- Propose preventative safety procedures for home, school, and community. PE
- Create posters showing ways to reduce the spreading of germs. PE, OE

Applications Across the Curriculum

Variations on a theme: Healthy Habits — Personal Fitness

Language Arts
- Construct a "Healthy Me" journal and document daily activities/behaviors used to maintain a healthy, clean body. P

Science
- Record pulse and respiratory rates before, during, and after exercise over an extended period of time. PE

Mathematics
- Display data about personal physical fitness. PE

Social Studies
- Play a game, from another culture, that requires physical activity. PE

Arts and Humanities
- Produce an exercise video. PE

Vocational Education
- Observe and record the physical activities required of teachers in your school. Design and present to the teaching staff a program for maintaining physical fitness. PE

Reflections

Fitness, exercise, and nutrition are the battle cries of the '90s. Students are faced with decisions regarding health issues each day—drug and alcohol abuse, HIV/AIDS/STDs, environment, disease control, and nutritional practices. As part of their schooling in self-discipline and physical fitness, students must take responsibility for their own health and well-being.

While health and physical education has always been a part of the traditional curriculum, the focus today goes beyond the classroom/gymnasium and permeates every aspect of the student's school day. Healthy decision making dictates a problem-solving approach that is personal and different for each student.

To equip students with the know-how to take responsibility for maintaining their health—within the school program and beyond the school walls—schools must orchestrate programs that emphasizes understanding, achieving, and maintaining physical wellness. This is perhaps best done as part of an encompassing program that requires students to be partners in a process that analyzes, prescribes, implements, and evaluates their physical needs.

Core Concept: Physical Wellness

Sample Middle School Activities

- Compile a portfolio of your fitness program including personal physical assessment, goals, improvement practices, and evaluations procedures. P
- Use a computer program to evaluate menus in the school cafeteria for nutritional value. PE
- Use multimedia to create and implement an advertising campaign showing the healthy behaviors that can help prevent major causes of death (e.g., heart disease, cancer, stroke, accidents). P
- Interview family members and friends to identify present practices for assessing, maintaining, and improving health status. Predict future health status of each person interviewed based on his/her present health practices. P
- Design and implement a plan to make your home safe for young children. PE

Applications Across the Curriculum

Language Arts
- Observe school cafeteria behaviors (e.g., table etiquette, food consumption) for one week. Based on your research, design a campaign to promote pleasant dining environments. PE

Science
- Chart physical descriptors (e.g., height, weight, age) of family members; discover trends and chart correlations between physical descriptors and personal habits (e.g., smoking, sleep requirements, diet, stress). P
- Interview physical wellness experts to determine habits that encourage optimal growth and development. Develop a personal physical wellness plan that will include weight management, exercise, nutrition, and rest. Monitor your progress. P

Mathematics
- Estimate the distance for a walking/jogging course around the school building. Determine how long it actually takes to walk the course. Compute individual walking/jogging pace. PE, P

Social Studies
- Survey, chart, and graph the average physical wellness of the school population and compare it to the standards of the President's Council on Physical Fitness. Create a school-wide plan for addressing areas that need improvement. P

Arts and Humanities
- Design health and nutrition posters for a senior citizens center, child care center, nursing home, and school cafeteria. PE
- Research a number of artistic styles that illustrate the human form. Compare current standards of physical wellness to the time period of the works of art. P

Vocational Education
- Investigate additives in processed food and the diseases caused by food additives. Develop a poster which communicates findings. OE
- Design a plan for forming, recruiting, and marketing a fitness group. PE, OE
- Evaluate dietary habits of peers; prepare bulletins designed to facilitate change in unhealthy eating habits. P

Core Concept: Physical Wellness

Sample High School Activities

- Design a brochure for health club members outlining recommended exercise that incorporates physiological concepts necessary for safe workouts. P
- Plan and implement a health fair that includes health screenings. Analyze participants' results and assist in setting goals. PE, P
- Use a Recommended Daily Allowances (RDA) chart to plan a week's menu for a family of four on an average food budget. Modify your plan to allow for one family member with diabetes. P
- Analyze a family life tree. Search for hereditary and lifestyle factors that may have contributed to deaths. PE, OE
- Simulate emergency situations (e.g., heart attack, choking, drug overdose, drowning, suicide attempt) and demonstrate appropriate responses. PE

Applications Across the Curriculum

Language Arts
- Create a "Staying Healthy Self-Help Guide for Adults" including a nutrition, hygiene, and physical fitness plan. Present this at a faculty or parent meeting. PE, OE, P

Science
- Analyze a meal to determine the biochemical components and nutritive value of each food on the menu. PE, OE, P
- Investigate factors that might have affected human life spans over the past 200 years. Chart and correlate findings. P

Mathematics
- Record your physical activities for a given period to determine the number of calories burned on an average day. Calculate the caloric intake needed to maintain your present weight. PE, OE, P

Social Studies
- Examine the influence of poverty on physical wellness by interviewing an employee of an agency established to serve the indigent. PE, P

Arts and Humanities
- Select and research a variety of examples of "the ideal human form" in history, literature, and art. Compare and contrast the examples and project what the "ideal" might look like in a hundred years. PE, OE

Vocational Education
- Debate pros and cons of raising tobacco as a cash crop in Kentucky. PE, OE
- Research importance of "green" spots in urban areas. Analyze findings relative to specific environments. PE, P
- Design a business proposal/plan for a health/fitness center in your community. PE
- Devise a personal wellness plan and a system to maintain that plan. Monitor progress. P

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.32: **Students demonstrate strategies for becoming and remaining mentally and emotionally healthy.**

Learning Links: Addictive Behaviors / Grief / Student Organizations / Support Groups / Relaxation / Drug Therapy / Self-expression / Counseling / Assertiveness / Arts and Crafts / Self-discipline

Related Concepts: Self-esteem / Interpersonal Relationship Skills / Communication / Stress Management / Refusal Skills / Conflict Resolution / Goal Setting / Self-assessment / Time Management

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Practice interpersonal skills which contribute to healthy relationships and self-esteem.
- Recognize the factors that influence self-esteem.
- Demonstrate techniques for stress management.
- Predict consequences of substance abuse and other addictive behaviors.
- Recognize that mental and emotional health problems can be treated.
- Express basic feelings and emotions in a positive way.

Middle School Demonstrators

- Analyze and apply strategies for achieving and maintaining self-esteem.
- Apply interpersonal relationship skills which contribute to emotional wellness.
- Use strategies to manage stress.
- Plan strategies for avoiding substance abuse and other addictive behaviors.
- Investigate methods of prevention, intervention, and treatment of mental and emotional disorders.
- Examine and modify nonconstructive expressing of emotions.

High School Demonstrators

- Evaluate methods for prevention, intervention, and treatment of mental and emotional disorders.
- Use prevention and intervention strategies for addictive behaviors.
- Practice interpersonal relationship skills which contribute to emotional wellness.
- Express personal emotions constructively and react to others' emotions appropriately.

Sample Teaching/Assessment Strategies:

Collaborative Process: Peer Tutoring, Brainstorming • **Community-Based Instruction**: Field Studies, Service Learning • **Problem Solving**: Simulation, Role-play, Interviews, Brainstorming, Inquiry • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a representative from a mental health agency to discuss mental and emotional disorders and/or ways to express feelings and emotions constructively.
- Invite a mental health expert to demonstrate the value of humor and other techniques for stress management.
- Tour a substance abuse treatment facility.

Core Concept: Mental and Emotional Wellness

Sample Elementary Activities

- Make a class Big Book entitled: "It's O.K." to illustrate that for every action there is a reaction. Describe a situation on one page, on the next page write "but it's o.k. to..." (e.g., "when my ice cream cone gets knocked out of my hand, it's o.k. to tell Mom; ask for another cone; feel sad; expect an apology"). OE
- Graph your positive characteristics and strong points. Develop a plan for self-improvement. OE, P
- Identify a situation which causes stress in your classroom; explore and practice ways to relieve the stress constructively. PE, OE, P
- Role-play a "what to do when" game to identify resources of treatment for mental and emotional health problems. PE
- Create a classroom collage of affirmations. PE
- View a television program; define ways emotions were expressed, both verbally and nonverbally, and determine the impact of the expressions on others. Discuss ways nonconstructive expressions might be modified. PE, OE

Applications Across the Curriculum

Language Arts
- Brainstorm ways to deal with stress. Create a bumper sticker to promote stress management. PE, OE

Science
- Develop and implement a plan to complete a science project. Set realistic short-term goals. Report your feelings as goals are met and when project is completed. OE, P

Mathematics
- Keep a mathematics journal (freewriting). Write positive and negative feelings about solving a mathematics problem. OE, P

Social Studies
- Research the elements of physical and emotional health. Produce role-plays to show the correct and incorrect strategies to promote good health. PE

Arts and Humanities
- Create a visual display to help someone change an unhealthy habit or manage stress. Present your work to a civic group and survey their reactions. PE, P

Vocational Education
- Plan and prepare a comic book which illustrates ways to use leisure time. PE, P
- Make a collage using the warning labels from advertisements for alcohol and tobacco products. PE
- Mime various emotions (e.g., sad, happy, mad). PE

Core Concept: Mental and Emotional Wellness

Sample Middle School Activities

- Develop and secretly implement a plan to bolster the self-esteem of someone you care about; keep a journal of your interactions with this individual. Analyze and report on those actions that appeared to be successful and unsuccessful. Discuss how this activity influenced your self-esteem. PE, OE, P
- Implement a three-week plan for changing a negative behavior or habit; use technology to record all progress and setbacks. Make appropriate adjustments for success. P
- Role-play a scenario where you experienced frustration, anger, disappointment, or grief. Identify ways the situation could have been avoided or handled differently. Discuss ways to release the stress of the negative feelings. PE, OE, P
- Use a word processor to draft and revise a letter to Dear Abby asking advice on how to handle a stressful situation in your life. In small groups, reply to a selection of the Dear Abby letters. PE
- Brainstorm situations in which members of the group felt uncomfortable in responding to others' behaviors or requests. Create a skit, rap, cartoon, or song that utilizes refusal skill techniques to respond to peer pressure. PE

Applications Across the Curriculum

Variations on a theme: Peer Pressure

Language Arts

- Read a novel in which peer pressure plays a major factor. P

Science

- Survey changing attitudes of students toward different subject areas and compare across different grade levels. Draw conclusions about the relation of the findings to peer pressure. PE, OE, P

Mathematics

- Design a "peer-pressure survey" about changing attitudes of students toward different subject areas. Compare across different grade levels, and display results as an index. PE, OE

Social Studies

- Examine the motives for cheating on tests and the ways in which these motives relate to peer pressure. OE, P

Arts and Humanities

- Create a collage with peer pressure as the theme. PE

Vocational Education

- Collect and analyze advertisements that use peer pressure as a marketing strategy. PE, OE, P

Reflections

Students' need for mental and emotional wellness parallels their need for physical wellness. In a time when stress, substance abuse, and addictive behaviors are current and well-researched topics in the typical school curriculum, the need for a focus on this academic expectation is already clearly established.

Students who are aware of their own mental and emotional wellness are more likely to consider those factors in their decisions. They must understand their own concerns, actions, and motives for their behavior, if they are to take responsibility for those behaviors and evaluate them for future changes. Their subsequent actions reflect that understanding in positive ways for themselves and others.

Through reflection and collaboration, students learn about themselves, become sensitive to the feelings of others, and learn how their actions and feelings affect others.

Core Concept: Mental and Emotional Wellness

Sample High School Activities

- Establish goals for improving and maintaining self-esteem; plan, implement, and record accomplishments. P
- Identify and analyze stressful situations in your life; develop a system for recording management progress. Select and implement a stress management technique (e.g., meditation, playing piano, exercise) for one month. Record and report findings. P
- Interview a graduate from a substance-abuse program; create a case study of his/her drug history, its effects, and the challenges of recovery. Present this case study. PE, OE
- Debate the prohibition of smoking in public areas. PE
- Research automobile accidents where alcohol or drug use was involved; express a personal opinion, in a presentation, about driving while under the influence of alcohol and drugs. PE, OE, P
- Produce a video of a workplace scenario to show how interpersonal skills with customers/clients affect profit and loss in the business world. PE

Applications Across the Curriculum

Language Arts

- Research as a class the issue of teenage suicide by engaging in several of the following activities:
  - Read a novel and/or watch a movie that focuses on teenage suicide.
  - Interview a psychiatrist who has worked with teenagers who have attempted suicide.
  - Spend an evening working on a call-in suicide prevention hotline.
  - Read articles and books about teenage suicide.
  - Interview parents, or other family members, of teenage suicide victims and/or attend a support group meeting for parents of suicide victims.
  - Gather information from other sources as needed.

  Use your research to create a one-hour multimedia program on teenage suicide which your class will present to students during a school assembly. ·PE, OE, P

Science

- Role-play a doctor who has diagnosed a patient as being HIV positive. Describe to the patient how the disease could have been contracted, the treatments that are available, the short-term and long-term outlook, and possible changes required in his/her lifestyle. PE, OE

Mathematics

- Identify dependent and independent variables in situations involving stress. Prepare a graph from words describing situation. OE

Social Studies

- Use generally accepted norms established by health experts to examine the mental and emotional wellness of a selection of past or present world leaders. OE

Arts and Humanities

- Create plaster masks that convey emotions; use the masks in a conflict-resolution dramatization. PE

Vocationa Education

- Develop a plan and work with small children to improve their self-esteem skills. PE
- Analyze the impact of marketing on self-esteem. OE

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.33: **Students demonstrate the skills to evaluate and use services and resources available in their community.**

Learning Links: Personal Wellness / Consumerism / Government / Medical Facilities / Immunizations / Health Insurance / Medicare/Medicaid / Communicable Diseases / Rehabilitation / Recreation / Welfare / Wellness Programs / Red Cross

Related Concepts: Health-Care Providers / Governmental Health/Safety Regulations and Standards / Governmental Health and Safety Agencies / Non-Profit Health Agencies / Health Systems

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Recognize governmental health and safety regulations.
- Identify community-sponsored agencies that maintain and promote health and safety.
- Explore non-profit, health-related agencies in the community.
- Investigate health providers in the community.

Middle School Demonstrators

- Evaluate available community health systems, services, and resources serving the needs of adolescents.
- Examine governmental health and safety regulations.
- Differentiate among various governmental, health and safety, regulatory agencies.
- Assess services of non-profit and community or state sponsored agencies that promote health and safety.
- Distinguish among various health-care providers; analyze their roles.

High School Demonstrators

- Evaluate and access available community health systems, services, and resources.
- Access governmental health and safety agencies and interpret their regulations and standards.
- Evaluate the role of non-profit and community or state sponsored health-related agencies to the health of the community.

Sample Teaching/Assessment Strategies:

Collaborative Process: Brainstorming, Cooperative Learning • **Community-Based Instruction**: Field Studies, Shadowing, Service Learning • **Continuous Progress Assessment**: Observation • **Problem Solving**: Case Studies, Interviews, Role-play, Creative Problem Solving, Future Problem Solving • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Interview community health specialists to determine their roles in providing health services.
- Tour an industrial facility to survey the preventive measures installed in the past ten years to conform to health and safety regulations.
- Visit community agencies to determine the health services they provide.

Core Concept: Community Health Systems

Sample Elementary Activities

- Interview a restaurant manager about the regulations (e.g., safety, sanitation) that must be followed. Rate the importance of the regulations and make a presentation including your justifications. PE, OE
- Identify a community agency that promotes bicycle safety. Have a representative from the agency assist the class in planning and implementing a school campaign which promotes bicycle safety. PE, OE
- Write a non-profit, health-related agency (e.g., Red Cross, American Heart Association, Hospice) requesting information; prepare a display for the school library. PE, P
- Classify local health-care agencies and providers by types; compile a personal directory which includes telephone numbers. PE, OE
- Create a coloring book that illustrates health providers in the community. PE, P

Applications Across the Curriculum

Language Arts
- Write an invitation to a variety of health-care professionals to participate in a "Health Care Awareness Day" for your school. PE

Science
- Research how water treatment maintains and promotes health in the community. Participate in a field study to the community water treatment plant. Develop an awareness brochure on the role the water-treatment plant plays in health maintenance. PE

Mathematics
- Use the yellow pages to produce a frequency table for the types of physicians available to the community; prepare a graph. PE, OE, P

Social Studies
- Make a map illustrating the locations of health-care providers in your community. PE

Arts and Humanities
- Make a poster that identifies sources of help for illnesses and accidents. PE, OE

Vocational Education
- Prepare a chart of pertinent, personal health information which would help a health professional provide emergency services. PE, OE, P
- Role-play procedures for accessing health-care services in various circumstances. PE, OE

Core Concept: Community Health Systems

Sample Middle School Activities

- Conduct a survey to determine the health-care needs and concerns of adolescents. Sort and classify your data into similar groups. Create visuals (e.g., posters, brochures, displays) showing health agencies, providers, and /or resources available in the community that address those needs and concerns. PE, OE, P
- Research governmental agencies' health and safety regulations and standards for a school campus. Use information gathered to address your school's compliance with the regulations and standards. Present your findings to the school-based council. PE, OE
- Prepare a video of the various governmental health and safety regulatory agencies and their functions. PE, OE, P
- Gather and disseminate information on community agencies that provide treatment for eating disorders. PE
- Create a skit showing health-care providers in their professional roles. PE

Applications Across the Curriculum

Language Arts

- Visit a local health agency (e.g., rehabilitation center, mental health center, health department, hospital). Interview health-care professionals to determine the services offered, cost, and eligibility requirements. Design and illustrate a brochure which presents findings. PE, P

Science

- Analyze an environmental health concern in your community. Identify and utilize agencies which can aid in resolving the potential problems. OE, P

Mathematics

- Use community census data to estimate projected number of nursing homes needed in 20 years. PE, OE

Social Studies

- Create and distribute, via the bookmobile, a video that describes local health-care services available to your community. Include the reasons why such services are provided (e.g., immunizations to prevent epidemics and to lower infant mortality). PE, OE, P

Arts and Humanities

- Establish criteria and evaluate the arts and crafts program in a long-term care facility.

Vocational Education

- Design an advertisement to promote participation in a blood drive. PE, OE, P

Core Concept: Community Health Systems

Sample High School Activities

- Prepare a guide for an AIDS patient which shows where to obtain physical, mental, and emotional care and support from community health systems and resources. PE, OE, P
- Contact an individual responsible for conducting site inspections for compliance with health and safety regulations and standards. Arrange to shadow this person during an on-site inspection. In advance, examine applicable regulations and standards; prepare an inspection checklist. Present a report of your experience. PE, OE, P
- Develop a multimedia presentation that depicts the value of a non-profit, health-related agency in your community. PE, OE
- Collect and analyze data on local long-term health care facilities; select a facility you would recommend; justify your choice. PE, OE

Applications Across the Curriculum

Variations on a theme: Preventive Health Care

Language Arts
- Identify a health issue pertinent to your locale for which preventive services are inadequate. Write a persuasive letter, to community or state leaders, to request their assistance in fulfilling the need. OE, P

Science
- Invite a panel of community health personnel to class who will discuss behaviors which are detrimental to promoting healthy prenatal conditions. OE, P

Mathematics
- Use actuarial statistics to show why insurance companies might promote preventive health care. Target probable causes of fluctuations in the tables and how this influences the recommendations. OE, P

Social Studies
- Discuss ways in which health concerns influence travel preparations. Identify the countries with the most and least restrictive preventive health measures for travelers; and communicate the information. OE, P

Arts and Humanities
- Videotape, edit, and broadcast the science class panel discussion on the school's closed-circuit TV. PE

Vocational Education
- Identify agencies in the community which will accept teens as volunteers or in service-learning projects. Establish a student group in the school to connect these agencies with student volunteers. PE, OE

Reflections

Students should be able to access facilities and services that promote and maintain healthy living. As well, they must have the ability to evaluate the effectiveness of these services. Students need to appreciate the role of non-profit organizations in the prevention and treatment of diseases, if they are expected to volunteer time and money for the continuation of these organizations which are vital to the community in which they live.

Also, as caring and knowledgeable citizens, students must be made aware of the obstacles that confront the handicapped, poor, elderly, and sick as they seek health services.

Students, who recognize that "no man is an island unto himself" and know that disease, illness, and accidents can strike anyone unexpectedly, will realize that some governmental intervention is necessary to ensure the health and safety of all individuals. In addition, an awareness of the types of governmental interventions will make them more conscious of their personal rights and responsibilities in the community.

This particular academic expectation lends itself to cross-curricular and community projects in which students become immersed in authentic, service-learning situations.

Goal 2: Apply Core Concepts and Principles

Academic Expectation

2.34: **Students perform physical movement skills effectively in a variety of settings.**

Learning Links: Games/Sports / Dance / Aquatics / Crafts / Seamstress / Sculpting / Astronaut / Surgeon / Musician / Data Entry / Circus / Gymnastics / Rules / Sportsmanship

Related Concepts: Fundamental Motor Skills / Movement Concepts / Skill Analysis / Manipulative Skills / Locomotion / Non-locomotion / Body Awareness / Space Awareness

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Elementary Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Analyze the fundamental motor-skill aspects of performance.
- Utilize fundamental motor skills and movement concepts to create movement sequences.
- Demonstrate fundamental motor skills (e.g., locomotor, non-locomotor, object manipulation) and movement concepts (e.g., body, effort, space awareness).
- Create movement using locomotion (e.g., walking, running) and non-locomotion (e.g., twisting, turning).
- Exhibit self-control in motor activities.
- Experiment with basic motor skill movement.

Middle School Demonstrators

- Reflect on personal motivation for psychomotor skill development.
- Access psychomotor skills (e.g., individual, dual, team) using movement, mechanics, and concepts.
- Demonstrate basic dance, aquatic, team, and individual/dual sport skills.
- Combine fundamental movement activities into purposeful movement patterns.

High School Demonstrators

- Evaluate physical activities for a variety of purposes (e.g., pleasure, fitness, competition).
- Analyze psychomotor skills (e.g., individual, dual, team) using movement mechanics and concepts.
- Demonstrate advanced levels of team and individual/dual sport skills.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, Brainstorming • **Community-Based Instruction**: Mentoring • **Continued Progress Awareness**: Portfolio Development, Self-assessment • **Problem Solving** : Creative Projects • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a representative from the YMCA/YWCA to explain available facilities including those for adaptive physical education activities.
- Invite community resource personnel (e.g., golf, tennis, dance instructors) to serve as skill-speciality consultants.
- Utilize local recreational facilities to provide opportunities for students to enhance skill development (e.g., tennis courts, golf courses, bowling centers).
- Invite a dance instructor, choreographer, or gymnast to help students plan a series of locomotion and non-locomotion movements to be set to music.

Core Concept: Psychomotor Skills

Sample Elementary Activities

- Analyze the skill of a partner in a psychomotor activity. PE, OE
- Balance on a variety of moving and non-moving objects (e.g., balance boards, skates, balance beams). PE, OE
- Develop a movement routine that involves the manipulation of an object (e.g., rope, hoop, ball) while moving to a rhythmical beat. PE, P
- Hand-dribble or foot-dribble a ball and maintain control in a group activity. PE
- Jump and land using a variety of take-offs and landings. Videotape and play back for analysis. PE, OE, P
- Strike a stationary ball using a hand, paddle, or bat. PE
- Utilize a variety of locomotor movements to explore the concept of personal space. PE, OE
- Pantomime an animate and inanimate object (e.g., robot, animals) as part of a group activity. PE, OE

Applications Across the Curriculum

Variations on a theme: The Circus

Language Arts
- Write a story in which you are a circus star. P

Science
- Experiment to find the ideal length for your own balance pole when you walk a balance beam. Discuss how this would relate to a tightrope walker. PE, OE

Mathematics
- Determine a method to estimate the height of a tightrope wire when you are sitting in the audience. PE

Social Studies
- Research similarities and differences between domestic and foreign circuses. OE, P

Arts and Humanities
- Create models of circus characters in motion. PE

Vocational Education
- Design a circus to be held on your school grounds starring your classmates and you. PE

Reflections

The ability to perform psychomotor skills begins with basic eye-hand coordination and locomotor and non-locomotor movement such as walking, running, turning, and twisting. Psychomotor abilities are fostered in physical education, fine arts, vocational education, and intramural and extracurricular activities. Traditional offerings include dance, aquatics, team and individual sports, sculpting, home economics, and technology education.

The personal skills students develop in team sports also support individually targeted goals throughout life. These life goals may be as a skilled seamstress, computer technician, sculptor, surgeon, musician, dentist, dancer, or athlete.

Psychomotor abilities are life skills that deserve explicit attention across the various curricula and across extracurricular activities sponsored and supported by the school. Development and refinement of these psychomotor skills are often nurtured through the many projects of the student's day. However, more deliberate focus can be incorporated into diverse subject-matter activities.

Core Concept: Psychomotor Skills

Sample Middle School Activities

- Prepare a critical-analysis report on skills exhibited in a specific sport. Present to your class. P
- Participate in a variety of team and individual/dual sports. Record and analyze your performances. PE, OE, P
- Perform structured dance (e.g., square dance, folk dance, ballroom). PE
- Perform a gymnastic routine with equipment and/or movements of choice. PE, P
- Design and perform dance routines that combine locomotor and non-locomotor movements into smooth, flowing sequences with intentional changes in direction, speed, and flow. PE, P
- Create modified versions of team and individual/dual sports (e.g., tennis, soccer). PE, OE

Applications Across the Curriculum

Language Arts
- Using movement sequence, tell a story without words. PE, OE

Science
- Design physical activities that can demonstrate various scientific principles or concepts, such as Newton's Laws of Motion. PE, OE, P
- Write a players' manual for a game to be played in microgravity or on another planet. Include rules, equipment needed, and desired skills. PE, OE, P

Mathematics
- Measure long-jump distances. Collect data to compute the class average. PE, P

Social Studies
- Research the influence of drugs and alcohol on psychomotor skills. Determine how this might impact your community. Create a visual presentation. OE, P

Arts and Humanities
- Design a walking aid that is functional and aesthetic for aging adults needing assistance. PE
- Listen to the "Troubadour Song" from Carmen. Create non-locomotive movement (e.g., twisting, turning, bending, stretching, swaying) to correspond with the sections of the formal musical structures. PE, OE, P
- Design figure drawings showing movements that stay in one place (e.g., shape, wiggle, balance, rise, sink). PE, OE
- Create movement sequences alternating movement and balance. Synchronize to a fast-tempo, musical selection (e.g.," Hooked on Classics"). PE, OE
- Create, as a team, a new sport incorporating drama, music, visual arts, and dance concepts. PE

Vocational Education
- Demonstrate the various gaits of walking on crutches. PE

Core Concept: Psychomotor Skills

Sample High School Activities

- Keep a portfolio to document an intermediate or advanced level of skill acquisition and cognitive understanding of an activity from the following categories: dance, aquatics, team, and individual/dual sports. OE, P
- Videotape performances involving dual sport activities and develop individual skill assessments based upon a critical analysis of video performance. PE, OE, P
- Develop a two-minute gymnastic routine utilizing equipment and movement (e.g., balance, rolling, weight transformation) that is synchronized to music. Demonstrate an obvious beginning and ending. PE, OE
- Participate in a racquet sport and identify the basic skills involved. Analyze individual performance and describe personal skill development in a written report. PE, OE, P

Applications Across the Curriculum

Language Arts
- Choose a specific physical activity in which you wish to engage over an extended period of time (e.g., semester, year). Develop criteria to judge your performance of this activity. Videotape performance at several intervals during the time period. At each interval, analyze your performance, and use the criteria to evaluate. Compare each performance to past performances. PE, OE, P

Science
- Route a laser beam through the hallways of your school using mirrors. Imitate the movement of the laser beam using locomotor skills. PE
- Produce a videotape of classmates performing an individual sport . Identify the required skills and formulate a plan to aid others in the development and improvement of these skills. PE, OE, P

Mathematics
- Prepare a presentation of how mathematics is important to sports or fitness programs. PE

Social Studies
- Research the influence of psychomotor skills on popularity. P

Arts and Humanities
- Paint a picture of a sports event you witnessed. PE

Vocational Education
- Videotape dance routines of individuals from various age groups. Analyze the performances and skill development in each group. PE, OE
- Simulate a board meeting; convince (sell) the board of directors to establish corporate teams (e.g., softball, golf, bowling). PE, OE

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.35:** **Students demonstrate knowledge and skills that promote physical activity and involvement in physical activity throughout their lives.**

Learning Links: Spectator / Sportsmanship / Exercise / Dance / Recreation / Leisure / Safety / Competition / Consumer / Elderhostel / Nutrition / Rules / Coaching

Related Concepts: Skill Training and Conditioning / Rules/Play Etiquette / Individual/Group Activities / Dual/Team Sports / Strategies of Play / Critical Thinking / Problem Solving / Outdoor Pursuit / Sportsmanship

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Develop a personal interest in participating in physical activities.
- Apply fundamental strategies in simple games and activities.
- Investigate the role of practice for successful participation in games and sports.
- Identify health benefits that result from regular participation in physical activity.
- Apply and use guidelines for the safe use of equipment and apparatus as related to lifetime physical activities.
- Identify components of acceptable and unacceptable behaviors in various physical activities.

Middle School Demonstrators

- Analyze the benefits (e.g., physical, mental, psychological, emotional) of involvement in lifetime physical activity.
- Explore ways to learn new lifetime physical activities.
- Apply rules and appropriate behaviors in lifetime physical activities.
- Apply basic strategies in games and sports.
- Investigate principles of training and conditioning for a variety of physical activities.

High School Demonstrators

- Demonstrate ability to learn and participate in lifetime physical activities.
- Analyze and demonstrate appropriate participant and spectator behaviors in lifetime physical activities.
- Analyze and apply strategies of play for a variety of lifetime activities.
- Plan, implement, and evaluate a skills-training and physical-conditioning program for lifetime physical activities.
- Demonstrate regular participation in individual, dual, or team activities with lifetime application.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Mentoring • **Continuous Progress Assessment**: Self-assessment, Portfolio Development • **Problem Solving**: Role-play, Simulation, Case Studies, Inquiry, Investigation • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite community members who engage in lifetime physical activities to speak on their pursuits.
- Visit a health club, fitness center, YMCA or YWCA to observe or participate in available activities.
- Tour a physical rehabilitation center to observe full range of motion of the human body.
- Invite members of the community who are good examples of physical fitness (e.g., basketball team, ballet dancers) to discuss/demonstrate things they do to stay in condition.
- Invite an insurance agent to present differences in insurance premiums for persons involved in perilous lifetime physical activities (e.g., hang gliding, skiing, mountain climbing, sky jumping).

Core Concept: Lifetime Physical Activities

Sample Elementary Activities

- Role-play appropriate and inappropriate participant/spectator behaviors in a game setting. Videotape and present to class. PE
- Create and perform a game or dance activity that represents a cultural background different from your own. PE, OE, P
- Interview a conditioning expert regarding appropriate and inappropriate techniques to be used during physical activities. Illustrate consequences of each. PE, OE, P
- Perform gymnastics routines using equipment (e.g., balance beam, horse, parallel bars, rope) and apply guidelines for safety. PE, OE
- Monitor heart rate before and after a jump-rope activity and discuss the benefits that are derived from regular participation in aerobic activities. PE, OE
- Create a poster illustrating the benefits resulting from regular participation in physical activity. PE, OE
- Write and illustrate a book of favorite physical activities. Explain why you like those activities. PE, OE, P

Applications Across the Curriculum

Language Arts

- Plan and perform a different physical activity one hour each day for one week. Keep a journal of your activities and your body's reaction to each. At end of the week, develop a personal fitness plan. OE, P

Science

- List physical activities in which you would participate on a summer vacation day and winter school day. Calculate and compare the number of calories you would burn on each day. PE, OE

Mathematics

- Compare calories expended watching an hour of television versus calories expended during other activities. PE, OE

Social Studies

- Interview older people to discover positive physical activities that lead to good health. Analyze data and use to prepare a collage of beneficial lifetime physical activities. PE

Arts and Humanities

- Illustrate the changes in attitude and outlook of an individual who routinely engages in physical activities. PE, OE, P

Vocational Education

- Brainstorm differences in physical activities during the human life cycle. OE

Core Concept: Lifetime Physical Activities

Sample Middle School Activities

- Research a game, sport, and/or dance activity representing different cultural backgrounds. Lead the class in one activity. PE
- Observe offensive and defensive strategies employed in a game activity; discuss ways these strategic principles can be used in life. PE, OE
- Create a visual display of the potential fitness benefits of a variety of lifetime physical activities. PE, OE
- View a video involving a game activity and discuss the ethical and unethical behaviors demonstrated by the participants. OE
- Survey members of the community about their physical activities and use a spreadsheet/database to chart the results by age groups. PE
- Record regular participation in an outdoor activity (e.g., hiking, canoeing, cycling) that is indigenous to the area and prepare a presentation summarizing your findings. PE, OE, P

Applications Across the Curriculum

Variations on a theme: Adult Fitness

Language Arts
- Interview a variety of adults about their structured physical activities. PE

Science
- Compile the interviews with adults, look for patterns of activity, and draw conclusions about the relationship between exercise and adult fitness. PE, OE

Mathematics
- Use statistics drawn from the interviews in a variety of ways to help in the analysis of the relationship between structured physical activities and adult fitness. PE, OE

Social Studies
- Investigate and present details about a variety of structured and unstructured adult physical activities. Discuss factors which help determine their popularity and ways in which participation in those activities is beneficial to adults involved. OE, P

Arts and Humanities
- Make a video showing a variety of physical activities based on the interviews. Include statistics and patterns resulting from the research. PE, OE, P

Vocational Education
- Invite personnel from local health organizations and fitness centers to a panel discussion on adult fitness and how it relates to adolescents. OE, P

Reflections

As students make the transition from school to family, career, and work, continuous involvement in physical activity becomes increasingly important to a lifetime of physical health and well-being. They must make fitness-conscious decisions about nutritious foods, exercise programs, and recreational activities.

The knowledge, skills, and attitudes students develop as young people influence their values in later life. If students leave school with positive attitudes about sportsmanship and competition, with a sound nutritional background, and with a sense of how to incorporate physical activity in their daily routines, they will have already adopted the habits of life-long fitness and well-being.

Sportsmanship, health, exercise-consciousness, and informed consumerism of food and drug products may be included in many of the curricular areas allowing students to demonstrate progress toward this academic expectation. Interdisciplinary teams can be used to target this academic expectation of valuing physical activity throughout one's lifetime.

Core Concept: Lifetime Physical Activities

Sample High School Activities

- Document your participation in a skills-training and conditioning program for a selected lifetime physical activity. P
- Analyze factors (e.g., time, cost, accessibility) related to regular participation in physical activity. Correlate the benefits versus these factors. OE
- Videotape spectator behaviors during a team or individual sporting event. Critique appropriateness of the behaviors and draw conclusions on the fan's knowledge of the game. Edit, narrate, and present the videotape. PE, OE
- Examine the risk and safety factors that may affect physical activity throughout life. Present findings. OE
- Observe and analyze spectator behaviors during a sport activity. Draw conclusions and make recommendations for improvement. PE, OE, P
- Choreograph and videotape a three-minute, aerobic dance routine. Teach to classmates. PE, OE

Applications Across the Curriculum

Language Arts
- Write a new physical activity involving teams, rules, and strategies of play. PE, OE

Science
- Develop a survey and gather data for correlating aerobic exercises and wellness. PE
- Monitor, quantify, and report a physiological change resulting from regular participation in a low-impact sport. OE

Mathematics
- Compare the cost and availability of participating in lifetime sports (e.g., swimming, golf, softball, bowling, running, horseback riding). Summarize results in a presentation; include information about the impact socioeconomic status has on a person who wishes to participate in some sports opportunities. OE, P

Social Studies
- Investigate the influence of lifetime physical activity on lifespan and its sociological implications. OE, P

Arts and Humanities
- Create a multi-generational play or skit communicating the value of lifetime physical activity. OE

Vocational Education
- Develop a program of physical activities for each member of your family. P
- Develop an exercise regimen for a heart-attack victim. Research and report the benefits of exercise on the cardiovascular system. OE, P
- Develop a training and conditioning program for athletes in various sports. P

Notes

Transformations:

Goal 2

Apply Core Concepts and Principles

Vocational Studies

Vocational Studies

Schools shall be measured on the proportion of students who make a successful transition to work, post-secondary education, and the military.

KRS 158.645

What are the options after schooling? What makes a good worker? How does an individual best present oneself? **All** students should ask these questions and find the answers as they progress through school, P-12. It is too often assumed that through a process similar to osmosis, students are prepared to make decisions about life after school. By incorporating the vocational studies academic expectations into the curriculum, that assumption will not continue to prevail, and students graduating from Kentucky's schools will be better prepared for a lifetime of rewarding careers.

Vocational studies focuses on three academic expectations: career path options, transition skills, and post-secondary opportunities search. These are academic expectations that all students should know and be able to do to make successful transitions from school to enriched lives in careers. Vocational studies differs from traditional vocational education programs which have been primarily designed to prepare students for specific jobs.

In the Rockford Elementary primary program, the students have been studying "Animals in Kentucky." They have read and written stories about wild animals, pets, and farm animals. They calculated the cost of feeding their pets, looked at the effect of animals on mental and emotional wellness, developed classification tables, and made collages showing the contributions of animals throughout Kentucky's history.

But Ms. Goins and Mr. Luther wanted to integrate vocational studies into the unit. They sought advice from their students.

"We could visit the Kentucky Horse Park and find out the kinds of jobs in the horse business," said Susie, who especially liked horses.

"Let's go to the stockyards and see what they do in that smelly place," Jim cried, very characteristically.

"I don't know," said Kate, "I think I'd rather talk to a lot of people, like veterinarians and pet-shop workers. Or maybe go to the zoo and see what workers do there."

They were full of ideas! The teachers were pleased; they learned from their students that vocational studies could be incorporated into almost any unit in ways that are exciting for students.

Vocational Studies for Elementary Students

How soon does [illegible] begin? The primary years provide appropriate opportunities for students to be involved in activities designed to develop an appreciation of work and an awareness of self and career options. They should examine the relationship between school studies and work; this will enable them to make vital connections that will give meaning to their learning. Elementary students should begin to develop a work ethic, work in teams, resolve conflict, and set short-term goals.

Vocational Studies in the Middle Grades

How do students make decisions about high school courses at the end of the eighth grade? Too often, decisions are made about high school with minimal student introspection, thought, or input. However, if students were given more opportunity to investigate career options, study the relationship between careers and life roles, and connect educational achievement to career opportunities, they would be more capable of setting clear directions and goals for high school and beyond.

Educators must do everything in their power to encourage and assist **all** students to be the best they can be. By integrating the vocational studies academic expectations into the curriculum, teachers help students create visions for their futures and to realize their full potential. In order to do that, students must lay the foundations through early exploration, planning, and periodic revisions of the goals they set for themselves.

In the middle grades, they should begin to intently investigate career options, explore mentoring relationships, and examine networking systems. Community-based instruction and youth organizations are excellent ways to instill a work ethic in students. Further, as they become employed in part-time and summer jobs, such as baby-sitting and yard work, students can start to consider and plan ways to market their strengths. Through all of these experiences, they begin to develop positive attitudes, learn perseverance, become dependable, take responsibility, and acquire other attributes that lead to success in life.

Vocational Studies for High School

Is there life beyond high school? Unfortunately, many students do not become concerned about life beyond school until their senior year. Eighteen-year-olds are expected to make one of the most crucial decisions in their lives, often with little advanced thought or preparation. How can they make wise decisions without having demonstrated strategies for selecting career-path options?

Students need to know the demands of a career and how it will affect their multiple roles in life. While in high school, they should focus on acquiring the knowledge and skills necessary for making successful transitions to college, technical school, military service, and/or work. Students must exhibit those attributes that are valued by employers and demonstrate the techniques for marketing themselves which will serve them throughout life in a rapidly changing technological society.

Closing Comments

> *One reason for the nation's 29% dropout rate is that young people don't see a clear connection between what they are supposed to learn in class and what they'll need to succeed in a career.*
>
> **Alan Deutschman**

Can society afford for students and schools to continue the practice of treating vocational studies as an afterthought? The answer is unequivocally no. It is vital that students learn about work. Therefore, the concepts learned in vocational studies are critical and must be made a part of the instructional program.

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.36: Students use strategies for choosing and preparing for a career.

Learning Links: Self-assessment / Labor Market Trends / Prediction / Trends / Community Service / Self-fulfillment / Adaptability / Teaming / Continuing Education

Related Concepts: Interest/Abilities/Aptitudes / Multiple Life Roles / Career Opportunities & Trends / Characteristics/ Requirements of Occupations / Career Planning / Career Diversity/Change / Economic Opportunities

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Compare different careers to determine the various requirements.
- Analyze and compare how different careers affect life roles (e.g., parent, spouse, community leader).
- Relate school studies to life pursuits.
- Examine and group careers found in the community.
- Communicate the concepts of work and career.

Middle School Demonstrators

- Evaluate a preliminary, personal career plan.
- Assess personal strengths, interests, and abilities.
- Analyze the relationship between educational achievement and career opportunities.
- Demonstrate knowledge of the interrelationship of life roles, lifestyles, and careers.
- Explore career options in different occupational clusters and geographic areas.

High School Demonstrators

- Make and defend a personal career choice.
- Appraise characteristics and requirements of personal career options; evaluate effects on lifestyles and multiple life roles.
- Analyze, interpret, and evaluate present and future job markets.
- Assess personal performances and interests; integrate assessment results in career planning.
- Analyze the interrelationships of school and work experiences to life goals and career planning.

Sample Teaching/Assessment Strategies:

Collaborative Process: Brainstorming, Cooperative Learning • **Community-Based Instruction**: Mentoring/ Apprenticeship/Co-op, Shadowing • **Continuous Progress Assessment**: Anecdotal Records, Interviews, Observations, Portfolio Development, Performance Events/Exhibitions • **Problem Solving**: Brainstorming, Inquiry, Investigation, Case Studies, Creative Projects, Interviews • **Technology/Tools**: Computers, Calculators, Interactive Video, Multimedia, Videotaping, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Shadow individuals on the job in the community and evaluate their careers based on pre-established personal criteria for a "good job."
- Invite a representative from an employment agency or placement firm to discuss present and future job opportunities at local, state, and national levels.
- Invite employers and representatives from universities and colleges, technical schools, and military branches to participate in a career fair.

Core Concept: Career Path

Sample Elementary Activities

- Use technology to investigate the educational and skill requirements of different careers. Present a visual to the class. PE, OE
- Interview family, neighbors, and school personnel to identify the demands their careers make on their personal time. Decide how this might impact their family roles and pursuit of personal interest. PE, OE
- Investigate how individuals in jobs use mathematics, science, reading, writing, and social studies in their work. Communicate through graphs and charts. PE, OE
- Collect real objects or tools used in specific careers in your community. Use your collection to group the careers into like categories. PE, OE
- Plan and participate in a hat day that illustrates different careers. PE
- Complete a series of chores over a one-week period. Discuss the differences between work and play. PE, OE

Applications Across the Curriculum

Language Arts
- Review career opportunities in local and statewide newspapers; classify the opportunities on a chart. PE, OE
- Compose a story about working in a career you have investigated. OE

Mathematics
- Use advertisements from local newspapers to compare the salaries of a number of occupations. Graph or chart your findings. PE, OE
- Explore careers (e.g., architect, sculptor, graphic designer) in which the use of shapes and models is an important part. OE, P

Arts and Humanities
- Compose a rap or other musical piece to describe the challenges of a career. PE, OE

Science
- Categorize the science-related "Help Wanted" advertisements. Graph and share the results. PE, OE

Social Studies
- Interview employees in various "judicial system careers" to determine their roles in ensuring due process. PE, OE

Practical Living
- Interview someone who works to determine the relationship between his/her occupation and lifestyle. Report your findings. PE, OE
- Research the number of people playing professional basketball and high school basketball. Discuss the actual opportunities in professional sports. OE, P

Core Concept: Career Path

Sample Middle School Activities

- Develop an Individual Career Plan (ICP) to determine courses for the freshman year. PE, OE
- Complete a range of assessment activities to identify strengths, interests, and abilities. Develop a personal profile. PE
- Survey individuals in various careers; graphically present the correlation between educational achievement and career opportunities. PE, OE
- Gather data (e.g., income, working conditions, continuing education requirements) about a number of careers which interest you. Using the data, develop a multimedia presentation which shows how career choice impacts lifestyle. PE, OE, P
- Initiate a one-day career exchange program with local community members. PE

Applications Across the Curriculum

Variations on a theme: Career Day

Language Arts
- Write letters inviting representatives from a variety of careers and institutions to participate in a "Career Day" in your school. OE

Science
- Design posters to be displayed at each booth which illustrates how that career has changed over time. PE, OE.

Mathematics
- Calculate the cost per student to each institution who sponsored a representative. OE

Social Studies
- Develop an assessment instrument and evaluate the use of democratic principles used by the group during the planning process for the "Career Day." PE, OE

Arts and Humanities
- Videotape, edit, and broadcast a tape with highlights of the "Career Day." PE, P

Practical Living
- Research stress and other health-related threats associated with each career exhibited; prepare bar graphs for display or dissemination on "Career Day." OE

Reflections

Stop the average high school senior in the hall and ask what he/she plans to do after graduation and the likely response will be, "Go to college." But, further questioning about the specifics will reveal that the student simply realizes the end of high school is nearing and he/she must do something afterwards; no thorough planning has occurred in making the decision.

Traditionally, instruction has focused intently on isolated, discrete facts/skills for twelve years with little regard for life beyond schooling. As early as primary school, students should begin to make connections between school and work. In adult society, work is viewed as a means of becoming a self-sufficient, contributing member of the community; yet little emphasis is placed on careers and career planning throughout elementary, middle, and high school. It is just suppose to happen.

The selection of a career path is dependent on so many variables, it often becomes an elusive process for many young people. Even adults who are proceeding along on a well-worn career path will often joke about what they want to be when they "grow up." Settling on a career option is complex and students need much guidance in this area. They must consider not only their interests, but also their aptitudes, which encompass their talents, skills, and attitudes.

You must do whatever you can to help prepare students to make career decisions beyond schooling. Cross-curricular instruction that connects content to work experiences is a natural strategy to use when working toward this academic expectation.

Sources: Fogarty & Haack—Future World, Future School
Fogarty & Bellanca—Patterns for Thinking, Patterns for Transfer

Core Concept: Career Path

Sample High School Activities

- Complete an Individual Career Plan (ICP) for your immediate future. Justify your plan. OE, P
- Develop a multimedia presentation depicting a new trend in an established career. P
- Explore the changing role of the military and its ability to provide jobs. Deduce changes in skills required to be a soldier of today as compared to 50 or 100 years ago. OE
- Generate a database of present and future job markets. Make an "endangered species" list of jobs and/or careers. PE
- Shadow an individual employed in a career that interests you. Project yourself in that role; illustrate/explain how certain characteristics you possess would meet those required in the career and how others would need to be strengthened. OE, P
- Modify the current Individual Career Plan (ICP), throughout high school years, using the career portfolio. PE, OE
- Interview employment counselors or personnel directors to determine the impact of school and work experiences on career planning.
- Use the results of your personal assessment surveys to select four or five career options. Investigate the characteristics and requirements of each. Prioritize the options based on how each might affect your lifestyle and multiple life roles. PE, OE

Applications Across the Curriculum

Language Arts
- Interview employers in the community and analyze the relationship between work and school. P
- Write letters to selected colleges/universities about an educational program for a chosen career. P

Mathematics
- Develop a statistical database on current and predicted career opportunities in an occupational cluster. P

Science
- Investigate and present careers that utilize a specific scientific technique (e.g., gene splicing, titration or remote sensing). OE, P
- Analyze the impact of extended life span on society. Predict the resulting effects on career opportunities for young people. OE

Social Studies
- Investigate careers in a specific occupational cluster; place each career on an international map to show where it is concentrated. PE
- Research and develop a board game showing how strengths, interests, and abilities will affect career choices in the social studies area. PE, OE, P

Arts and Humanities
- Design a multimedia presentation on a selected career. PE

Practical Living
- Interview individuals (e.g., sports broadcasters, coaches, athletic trainers, physical therapist, fitness center owners/instructors, YMCA/YWCA directors, camp directors) who participate in careers linked to physical activities. Investigate employment opportunities and educational requirements for these careers. OE, P
- Tour Kentucky Tech Centers to observe and collect information about different technical training programs. PE

Goal 2: Apply Core Concepts and Principles

Academic Expectation 2.37: Students demonstrate skills and work habits that lead to success in future schooling and work.

Learning Links: Responsibilities / Rights / Technology Applications / Resource Management / Appearance / Teaming / Internship / Apprenticeship / Public Speaking / Cultural Diversity

Related Concepts: Conflict Resolution / Work Ethics / Teamwork / Leadership / Critical Thinking / Problem Solving / Self-assessment / Communication Skills / Interpersonal Skills / Self-motivation / Self-discipline / Safety

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Seek and demonstrate appropriate resolutions to conflict.
- Demonstrate positive work ethics and habits.
- Attempt new tasks and/or challenges with confidence.
- Use technology to display information in various ways.
- Use team skills in a group to complete a task and/or solve problems.
- Share tools and work cooperatively on a task.

Middle School Demonstrators

- Practice mediation/facilitation skills to assist with conflict resolution and problem solving.
- Evaluate work ethics of self.
- Compare and analyze the effectiveness of various technology and use for a specific purpose.
- Analyze and practice employability attributes valued by employers.
- Demonstrate behaviors which reflect concern for the safety of self and others.

High School Demonstrators

- Interpret new knowledge/skills/experiences; integrate with existing information; apply in a workplace concept.
- Use mediation/facilitation skills to assist with conflict resolution and problem solving.
- Assess employability attributes and work ethics of self and others.
- Analyze, select, and use appropriate technology to efficiently complete a task and/or enhance productivity.
- Modify behaviors which jeopardize the safety of self and others.

Sample Teaching/Assessment Strategies:

Collaborative Process: Brainstorming, Cooperative Learning • **Community-Based Instruction**: Mentoring/ Apprenticeship/Co-op, Shadowing • **Continuous Progress Assessment**: Observation, Performance Events/Exhibitions • **Problem Solving**: Case Studies, Creative Problem Solving, Debate, Interviews, Research, Role-play, Simulation • **Technology/Tools:** Computers, Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Work with the local chamber of commerce to develop internship experiences for students.
- Invite a labor relations mediator to demonstrate mediation and negotiation skills.
- Invite a business representative to discuss the effects of negative employee attributes on profit margin.

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Core Concept: Transition Skills

Sample Elementary Activities

- Role-play the process of resolving a conflict. PE
- Create a mural to illustrate work ethics and habits of employees in a variety of occupations. PE, OE
- Use a technology tool (e.g. computer, telephone, FAX) with which you have had no prior experience. PE
- Use a telephone simulation to demonstrate proper telephone techniques. PE
- Work in a group to design a collage illustrating the type of dress appropriate for a specific workplace. OE
- Develop and implement a plan to improve a personal characteristic for work habit (e.g., completing task on time, being dependable, working well in a group). PE, OE

Applications Across the Curriculum

Variations on a theme: Work Skills

Language Arts
- Interview a school principal. Discuss how communication skills are used in the job. PE, OE

Science
- Develop a checklist of basic and integrated science process skills. Interview employees in various occupations to determine which skills they use on their jobs. PE

Mathematics
- Collect data and tabulate what workers in your school feel are the most important job skills. PE, OE

Social Studies
- Develop and distribute a survey to discover what people in your school feel are the ten most important work skills. PE, OE

Arts and Humanities
- Design an award for an outstanding worker in your school. PE

Practical Living
- Develop a theme collage of people at work that focuses on a work skill. PE

Reflections

How many times have you waited in line for service while employees casually chatted? How often have you called a place of business to be treated as if you were a real bother? It doesn't take long for us to complain to friends about the poor service we received and declare we wish "these people" had been taught good work ethics at some point in their lives! The reality is that kids who are not taught these traits in school find it difficult to learn them as adults.

Attributes such as positive work attitudes, dependability, maintaining confidentiality, self-motivation, perseverance, and patience must be emphasized in instruction. Service-learning projects and other community-based instructional strategies are excellent ways for students to see the importance of employability attributes in life.

Students must be given opportunities to investigate and practice skills that are desired of workers and teachers must serve as role models. Developing a work ethic that is appreciated in our society is critical if students are to make a successful transition from high school to post-secondary experiences, and to life itself.

Source: Fogarty, Perkins & Barell—The Mindful School: How to Teach for Transfer

Core Concept: Transition Skills

Sample Middle School Activities

- Work with a group to plan and produce a technologically innovative media presentation. Record conflicts which arise; note the mediation/facilitation skills used in resolving the conflicts. PE
- Research employability attributes valued by employers. Based on your research, develop a survey instrument; conduct a survey of teachers, parents, and neighbors to determine the attributes they think are most important. Analyze the survey results and prepare a summary report. PE, OE
- Observe a workplace scenario; develop and present a chart of the positive and negative attributes exhibited. PE, OE, P
- Design a community-based project to provide services (e.g., lawn mowing, reading mail or books) to senior citizens. Establish criteria, in advance, for evaluating the work ethics practiced by each worker. Use the criteria to evaluate yourself. PE, OE
- Plan and produce a videotape that shows a work team solving a work-related issue. PE, OE
- Create a display, poster, or collage of safe and unsafe practices in school, on the bus, or in the home. PE

Applications Across the Curriculum

Language Arts

- Assemble a toy following the company's written or graphic directions. PE
- Watch and analyze a television program that depicts people in the workplace; chart employability attributes as acceptable/unacceptable. Discuss the realities of the program's portrayal of work. PE, OE

Science

- Debate the advantages and.disadvantages of developing a natural area for commercial use from the perspectives of different community members. PE, OE
- Role-play a situation that might occur in a science or technology-related career (e.g., space exploration) if someone on the team was undependable. PE, OE

Mathematics

- Create a survey and collect data on middle school students' ideas about employee attributes. Present your conclusions using graphics. PE, OE
- Plan a class trip that fits within a defined budget; at the conclusion, present how the group used employability skills (e.g., teamwork, critical thinking, creative thinking, resource management, conflict resolution) in the planning process. PE, OE, P

Social Studies

- Develop a government-job showcase in which skills, knowledge, and attributes needed for specific careers (e.g., police officer, court designated worker, firefighter, judge) are presented. Role-play a work scene. PE, OE

Arts and Humanities

- Develop and present a drama depicting work ethics. PE, OE
- Design and display a work safety poster. PE, OE

Practical Living

- Investigate a sports-related job to determine the desired employee attributes required for the position. PE, OE

Core Concept: Transition Skills

Sample High School Activities

- Participate in an apprenticeship, co-op, volunteer, or intern program; practice work ethics and habits valued in the work setting. Complete a self-evaluation. PE, OE
- Reconstruct problems in a workplace setting that may have been caused by misunderstandings about other cultures, personalities, and/or work styles. Illustrate the use of mediation/facilitation skills. PE, OE
- Participate in youth organization projects; make a presentation to a community group about how involvement in youth organizations can contribute to job readiness. OE, P
- Research an avocation/career that demands extreme commitment and dedication. Draw and present your conclusions on why someone might choose that avocation/career. OE, P
- Work in a group to design and implement a community project that will utilize a variety of technology skills. Use pre-established criteria to evaluate the employability attributes and work ethics of each group member. OE, P
- Compile an inventory of unsafe behaviors exhibited by teenagers. Design and produce campaign materials (e.g., video presentation, brochures) to promote a change in those behaviors. Plan strategies and implement the campaign. OE, P
- Analyze and evaluate the issues of a labor dispute in your community. Simulate a similar dispute in a class group; mediate to resolve the conflict. PE, OE

Applications Across the Curriculum

Language Arts

- Develop a safety manual for a specialized classroom (e.g., chemistry, computer, home economics). P
- Organize a seminar which focuses on skills and attributes most valued by employers. Develop a handbook for distribution to the students. PE, OE, P

Science

- Survey individuals employed in science-related careers to identify critical attributes of each career. Correlate your findings and complete a self-assessment to determine your areas of strength. PE, OE
- Collaborate with local industries, businesses, conservation offices, and colleges to plan and implement a conference (e.g., Earth Day, Career Work Fair) for your local school and community . PE

Mathematics

- Create a survey for high school students about their expectations for a job. Survey employers about their expectations of employees. Correlate the two surveys and publish your findings on a database. OE, P
- Create a business enterprise as a group. Project the budget, including profits, for the first year. PE, OE

Social Studies

- Research labor strikes to determine the impact on industries and careers. OE
- Research the community's potential for industrial growth. Utilizing this information, role-play a board meeting at which construction of a new factory is being considered. PE, OE

Arts and Humanities

- Create and express in an art form (e.g., painting, play, skit, musical composition) interactions that might occur between an employer and employee. PE, OE

Practical Living

- Research factors (e.g., cost, benefits) to a business/company considering providing health clubs for its employees. PE, OE

Goal 2: Apply Core Concepts and Principles

Academic Expectation **2.38:** **Students demonstrate skills such as interviewing, writing resumes, and completing applications that are needed to be accepted into college or other postsecondary training or to get a job.**

Learning Links: Applications / Interviews / Planning / Continuing Education / Multimedia Research / Networking / Mentoring / International Markets / Future Trends / Supply/Demand

Related Concepts: Goal Setting / Networking / Mentoring / Marketing Self / Critical Thinking / Communication Skills / Problem Solving / Decision Making

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Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Develop a transition plan from elementary to middle school.
- Examine the concept of mentoring.
- Develop and implement a personal short-term goal based on self-assessment.
- Create ways to depict personal strengths.
- Assume responsibility for completing chores.

- Develop a transition plan from middle to high school.
- Develop intermediate and short-term goals.
- Evaluate personal presentation skills.
- Examine the concept of networking.
- Act as a mentor.
- Develop and use strategies to highlight personal strengths.

- Design and implement a self-marketing package (e.g., resume, application, portfolio).
- Evaluate post-secondary programs and/or work opportunities.
- Develop short-term, intermediate, and long-term goals for searching post-secondary opportunities, include mentoring and networking. Justify plan.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Mentoring/Apprenticeship/Co-op, Shadowing • **Continuous Progress Assessment**: Self-assessment, Observation, Performance Events/Exhibitions • **Problem Solving**: Inquiry, Case Studies, Creative Projects, Interviews • **Technology/Tools**: Calculators, Computers, Interactive Video, Telecommunications, Video/Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite an employment service representative to discuss the value of networking in the employment search process.
- Invite personnel and admissions directors to critique student applications.
- Invite a panel of individuals and their mentors to illustrate the effectiveness of mentoring systems.
- Invite a personnel director to conduct mock interviews.

Core Concept: Post-Secondary Opportunities Search

Sample Elementary Activities

- Brainstorm and discuss changes that might occur when someone enters middle school. Project strategies for a smooth transition. Design and implement a transition plan. PE, P
- Set short-term personal goals; monitor and record your progress. P
- Appraise personal skill(s) to identify those in which you are particularly proficient; select an older partner and complete a product with his or her support. PE, OE, P
- Analyze chores in home or school to determine which ones you are qualified to complete. Convince a family member or teacher to let you assume responsibility for one or more choices. PE, OE

Applications Across the Curriculum

Language Arts
- Read a story about an individual who set a personal goal; organize and display the steps taken to reach the goal. OE

Science
- Identify persons within the school with whom you may network to complete a science project. PE

Mathematics
- Use a scale of 1 to 10 to graph your personal strengths; write a persuasive letter to an individual or group presenting your qualifications to provide a specific service. OE

Social Studies
- Invite a law enforcement officer to assist the class in setting goals for becoming better citizens. PE, OE
- Host a "Dress-Like Day" where students wear apparel from characters in history. Determine the occupation of each character. PE

Arts and Humanities
- Create a television show, "Jobs I Can Do," by illustrating jobs at home, classroom, and school. PE, P

Practical Living
- Establish a mentoring relationship with an adult to develop a plan that deals with one aspect of wellness (e.g., nutrition, exercise). OE, P

Core Concept: Post-Secondary Opportunities Search

Sample Middle School Activities

- Select an elementary student to mentor. Develop and implement a plan to assist the student in making the transition into middle school. PE, P
- Videotape and critique a mock interview. PE, P
- Create and present a marketing strategy for selling a service you have to offer (e.g., lawn care, baby-sitting). Investigate requirements of the service and produce a visual tool to use in marketing your service. PE, P
- Develop goals and plans for getting a summer job; have classmates critique your plan. Create a network of individuals who might help you make connections for obtaining a summer job. Make contacts. PE, OE
- Network with others to complete a task/project. PE

Applications Across the Curriculum

Language Arts
- Develop a personal job resume for a position (e.g., baby-sitting, pet care, lawn care). PE
- Write a letter to accept/reject a story submitted to a publishing company. OE
- Conduct a panel discussion about being in middle school for elementary school students. PE, OE

Science
- Form a network of science professionals to assist the class in planning an out-of-state, science-related trip (e.g., space center in Alabama). PE

Mathematics
- Tutor a younger student in mathematical applications. PE, OE
- Set goals to improve mathematical skills; write a self-assessment of mathematical progress at the end of each grading period. PE, OE

Social Studies
- Develop immediate and long-term goals to help a candidate seeking a public office. PE, OE
- Interview a local politician about the use of networking in political careers. PE

Arts and Humanities
- Create a video self-portrait. P

Practical Living
- Assist an inactive adult in setting intermediate goals for a healthy, active lifestyle. PE, OE

Core Concept: Post-Secondary Opportunities Search

Sample High School Activities

- Develop a network to enhance the implementation of your career plan. P
- Assess availability of mentoring opportunities within a chosen career. Participate in a mentoring program. Share what has been learned in an oral presentation, report, brochure, or video. PE, OE, P
- Request and examine catalogues from various post-secondary institutions. Evaluate them as they relate to career goals and personal resources. OE, P
- Survey community businesses and post-secondary institutions to determine the most valuable elements of a self-marketing package. Develop a prototype package. OE, P
- Visit a post-secondary institution which offers programs that relate to a career choice. Chart and present strengths and weaknesses of the institution. PE, OE
- Develop goals and plans for an opportunities search leading to a mock interview with a business, industry, or school person. Videotape the interview for evaluation. .OE, PE, P

Applications Across the Curriculum

Variations on a theme: Goal implementation

Language Arts
- Present a proposal to the school board requesting a day from the school year to use for a career exploration opportunity, such as shadowing. PE, OE

Science
- Shadow a local citizen who in involved in a science-related career . Summarize the experience. PE, OE

Mathematics
- Research statistics on the number of men and women represented in mathematic-related fields and the kinds of careers pursued by each. Examine current trends to determine a change in career goals. PE, OE

Social Studies
- Interview community leaders and recent graduates about the importance of goal implementation when conducting a search for the "right" college, university, technical school, or satisfying job. PE, OE

Arts and Humanities
- Research the importance of second language skills in post-secondary opportunities. Visit a middle or elementary school to assist students in setting goals for becoming proficient in a second language. PE, OE

Practical Living
- Investigate and present the impact of goal implementation on the mental wellness of an individual. OE

Reflections

Receiving an acceptance letter from a major university or from a personnel director with a major company often depends on the applicant's ability to present him/herself in the best light. While "post-secondary opportunities search" is a concept that logically concerns high school students, many aspects encompassed in learning to market oneself should begin in primary school.

Students do not magically become aware of their strengths, have the ability to set realistic goals, and have the confidence to persuade others of their capabilities. These skills must be taught and practiced over time.

Teachers must guide students in setting expectations for future plans, in the investigation of alternative paths, and in the development of strategies to achieve their goals. The key to students enhancing their post-secondary opportunities is the expectations they have of themselves. These are areas that all grade levels and all teachers can target.

Notes

Transformations:

Goal 3

Become Self-Sufficient

A self sufficient individual. **Photo by Rick McComb.**

Goal 3: Become Self-Sufficient

Academic Expectation

3.1 **Students demonstrate positive growth in *self-concept* through appropriate tasks or projects.**

Learning Links: Resume / Community Service / Journal / Goal Setting / Support Groups / Counseling / Self Portrait / Mentor / Hobbies / Portfolio / Continuing Education

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Attempt new tasks or challenges with confidence.
- Express ideas, opinions, and feelings in appropriate ways.
- Accept recommendations for self-improvement.
- Identify personal strengths.
- Complete short-term tasks with personal satisfaction.

Middle School Demonstrators

- Complete long-term tasks with personal satisfaction.
- Express ideas, opinions, and feelings in appropriate ways.
- Use recommendations for self-improvement.
- Analyze personal strengths needed to accomplish a task.
- Approach new tasks/challenges voluntarily.

High School Demonstrators

- Complete complex long-term tasks with personal satisfaction.
- Develop strategies for self-improvement.
- Analyze and demonstrate personal strengths to accomplish goals.
- Express ideas, opinions, and feelings in appropriate ways.
- Initiate new tasks/challenges with confidence.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring, Reciprocal Teaching • **Community-Based Instruction**: Field Studies, Mentoring/Apprenticeship/Co-op, Networking, Service Learning, Shadowing • **Continuous Progress Assessment**: Portfolio Development, Self-assessment, Performance Events/Exhibitions • **Problem Solving**: Debate • **Technology/Tools**: Interactive Video, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Enlist members of the community to become mentors to students.
- Contact state and local agencies for recommendations about service learning opportunities (e.g., Big Brothers-Big Sisters, local churches, local service clubs, Administrative Office of the Courts, scouting programs, Cabinet for Human Resources, local health department).
- Invite community people (e.g., hairdressers, cosmetic consultants, clothing store representatives) to conduct a self-image fair and consult with students.

Core Concept: Positive Self-Concept

Sample Elementary Activities

- Research famous people to determine the characteristics you admire and would like to develop. Prepare a group chart of characteristics most admired. Record times when you display those characteristics. PE, OE, P
- Illustrate different responses to peer pressure, using art, music, drama. PE
- Brainstorm a list of positive characteristics. Individually, identify those that describe yourself. P
- Draw a picture of what you would like to be when you are an adult. PE
- Represent your positive characteristics in a collage. PE

Sample Middle School Activities

- Compare the costs of various athletic shoes and determine why some cost more than others. Display your comparison in a graph on a database. Develop several theories as to why people are willing to pay more for some brands. OE, P
- Design and complete a service project entitled "Caring Enough to Give." PE, OE, P
- Make a pie chart to represent your positive and negative characteristics. Develop a plan for self-improvement. P
- Develop a list of positive and negative study habits. Set goals for self-improvement and record progress. OE, P
- Record the statements overheard for 24 hours which "kill" positive self-concept. Rewrite these "killer" statements so they become positive. P

Sample High School Activities

- Research urban and rural areas in at least three states to determine the spending patterns of teens. Establish a database to display findings and discuss how purchases reflect self-concepts. OE, P
- Research persons who have overcome obstacles in their lives. Identify characteristics which have enabled them to overcome these obstacles and draw parallels to your own life. Set goals for self improvement. Record progress in portfolio. OE, P
- Research historical figures (e.g., Henry David Thoreau, M. Ghandi, Martin Luther King, Charles Darwin, Isadora Duncan, Cora Wilson Stewart, Sojourner Truth, St. Francis of Assisi, Harriet Tubman) investigating why they devoted their lives to their beliefs. Demonstrate your findings in an unique way. P
- Select one person in your life and record in a journal interactions for one week. Analyze how your ideas, opinions, and feelings were expressed and received. P

Reflections

To succeed in our complex society, students need to be self-sufficient individuals who possess a positive self-concept. They must see themselves as problem solvers and decision-makers.

As students recognize their own strengths and weaknesses and develop confidence in their abilities to meet challenges, they will exercise initiative and perseverance to complete a wide variety of tasks.

When students are challenged with learning situations that engage all the intelligences and which promote productive problem-solving, they develop their talents and learn to rely on their abilities.

In addition, students with a positive self-concept become self-reliant citizens who can take care of themselves and their families and contribute to the greater community, thus strengthening society as a whole.

Source: de Bono—Teaching Thinking

Goal 3: Become Self-Sufficient

Academic Expectation

3.2: Students demonstrate the ability to maintain a *healthy lifestyle.*

Learning Links: Immunization / Health-Care Reform / Day Care Services / Nutrition / Sex Education / Exercise / Stress Management / Leisure Activities / Addictions/Compulsions / Drug Education / Physical Exams / Genetics

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use elements of a healthy lifestyle to achieve/maintain physical and mental well-being.
- Analyze situations that support or limit a healthy lifestyle.
- Identify resources that support a healthy lifestyle.
- Recognize elements of a healthy lifestyle.

Middle School Demonstrators

- Design a physical fitness program to meet personal needs and interests.
- Analyze and use leisure activities to maintain a healthy lifestyle.
- Implement nutritional practices related to wellness and fitness.
- Apply strategies which promote mental well-being.
- Investigate factors which affect the development of physical and mental well-being.

High School Demonstrators

- Develop, implement, and critique an on-going personal program for physical and mental well-being.
- Engage in a physical fitness program and apply nutritional principles to maintain wellness.
- Evaluate the effect of environmental factors on a healthy lifestyle.
- Appraise the effects of addictions and compulsions on mental and physical wellness.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Field Studies, Mentoring/Apprenticeship/ Co-op, Networking, Service Learning, Shadowing • **Continuous Progress Assessment**: Self-assessment, Portfolio Development • **Problem Solving**: Case Studies, Inquiry, Interviews, Oral History, Role-play • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a nutritionist or health care professional to discuss the relationship between diet and good health.
- Invite the county extension agent or home economist to show ways to prepare low-fat meals.
- Visit a local fitness center and design a personal exercise program.
- Invite a health care professional to talk about stress-related health issues and stress management.

Core Concept: Healthy Lifestyle

Sample Elementary Activities

- Record personal diet for one week. Classify your intake servings in basic food groups. Analyze diet and report the results. Prepare a class chart which shows the intake of food groups. PE, OE, P
- Participate in activities that help you relax (e.g. walking, playing with a pet, listening to music). Record your feelings. P
- Conduct a survey about lifestyle habits and record healthy and unhealthy habits. Create a database of characteristics of healthy lifestyles. P
- Interview health care professionals and collect information related to a healthy lifestyle. Design a pamphlet to represent your findings. PE
- Make a collage of leisure time activities. PE
- Interview an active elderly person about personal lifestyle and health maintenance. Design a fitness program for that person. PE, OE

Sample Middle School Activities

- Describe situations that cause stress in your life. Investigate common methods of coping with stress and tension. Develop a personal plan for improved stress management. OE, P
- Create cartoons to promote sound nutritional practices and publish them in the school paper. PE, P
- Choose four different physical exercises and perform them to music. PE
- Interview high school athletes about personal training programs. Compare with the exercise of non-athletes and analyze the differences. OE
- Investigate community sponsored activities for your age level. Prepare a presentation for the city council for revisions or new programs. PE

Sample High School Activities

- Use photography to illustrate environmental factors that affect physical and mental well-being. PE, P
- Survey students to determine their level of involvement in physical activities and publish the results in the school newspaper. Use technology to input, organize, and report the information in a format with diagnostic/prescriptive implications for a healthy lifestyle. PE, P
- Host a Community Health Fair. PE
- Identify stressful situations in the school environment. Propose stress reduction strategies to the school council. PE
- Create a dramatic scene to portray the effects of drugs on physical and mental wellness. PE, OE, P

Reflections

Paralleling the value of a positive self-concept is the need for a healthy lifestyle. When students develop a lifestyle that embraces good nutrition and a routine that includes both physical exercise and time for personal reflection, they begin habits which can be more easily carried into their adult lives.

There is a strong link between a healthy lifestyle and the ability of a student to behave in self-sufficient ways. Active engagement in a physical fitness program and the commitment to good nutritional habits enhance feelings of self-control and positive self-image.

Goal 3: Become Self-Sufficient

Academic Expectation

3.3: **Students demonstrate the ability to be *adaptable and flexible* through appropriate tasks or projects.**

Learning Links: Planning / Conflict Resolution / Life Changes / Evolution / Risks / Compromise / Tolerance / Chaos / Democracy / Conservation / Forecasting / Retraining

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use appropriate behavior in response to environmental, social, and personal change situations.
- Adapt to a wide variety of people/situations in school and community.
- Plan alternative responses to various situations.
- Analyze the effects of change on personal life.
- Identify changes in daily life.

Middle School Demonstrators

- Manage emotional, physical, and social changes as part of personal growth.
- Work cooperatively with a wide variety of people and reflect on reasons for adapting behavior.
- Differentiate between things an individual can and cannot change.
- Use appropriate behavior in response to environmental, social, and personal change situations.
- Plan and justify alternative responses to change.

High School Demonstrators

- Plan and execute appropriate responses to change.
- Work cooperatively with a wide variety of people in life situations.
- Use appropriate behavior in response to environmental, social, and personal change situations.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Service Learning, Mentoring, Shadowing • **Continuous Progress Assessment**: Self-assessment • **Problem Solving**: Inquiry, Role-play, Debate, Creative Problem Solving •**Technology/Tools**: Games, Puppets • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a volunteer to share information on other cultures. Contact the Kentucky Council on International Education for suggestions.
- Work with representatives from state agencies (e.g., Department for Disaster and Emergency Services or Cabinet for Human Resources) and local health care agencies to simulate an emergency situation (e.g., tornado, earthquake or flood) at the school.
- Invite mental health counselors from the community to work with students regarding appropriate behavior in different situations.

Core Concept: Adaptability and Flexibility

Sample Elementary Activities

- Brainstorm problems in the school environment. Identify the ones which can be changed and suggest solutions. PE, OE, P
- Write a book entitled "Things I Would Do If..." P
- Role-play behaviors in various life situations (e.g., birthday party, sports events, family reunion). Describe how behaviors change in different situations. PE, OE, P
- Develop a plan to make your school and all its programs more accessible to the handicapped. Present the plan to the school council. PE, OE, P

Sample Middle School Activities

- Write a "Dear Abby" letter about an emotional, social, or physical problem. Exchange and answer the letters. OE, P
- Determine the potential damage an earthquake could cause to your school and develop a survival plan. OE, P
- Draw a time line to depict major changes in your life. Describe how you handled those changes. PE, OE
- Interview a local government official about the role of compromise. PE, OE
- Hypothesize about how change can take different forms and predict how that could have impacted your future. PE, OE, P

Sample High School Activities

- Describe at least five alternative ways of having the school prom. Discuss the pros and cons of each. Arrive at consensus. Identify reasons for the decision. OE, P
- Develop a crisis intervention plan for a real-life situation. P
- Identify an environmental problem in the community. Develop potential solutions and work for change. PE
- Develop a branching hypermedia program to illustrate consequences of different behaviors. PE

Reflections

Whether discussing the educational, professional, or personal environment, the most common denominator of life is change. This academic expectation focuses on the need to successfully adapt and remain flexible when confronted with the uncertainties of life. Students must approach life's uncertainties as creative risk-takers.

Students must develop the ability to be flexible thinkers who can shift gears, change direction, and adapt to unexpected obstacles. Developing the skill of generating numerous ideas and brainstorming a variety of alternatives for approaching a problem enhances not only thinking skills, but employment opportunities as well.

In school, on the job, and in their personal lives, students will need to be able to adapt to the ever-changing tides of life. Providing students with opportunities to practice the necessary skills involved in confronting a variety of changes will equip them to support personal and professional change now and in the future.

Goal 3: Become Self-Sufficient

Academic Expectation 3.4: Students demonstrate the ability to be *resourceful and creative.*

Learning Links: Design / Inventions / Models / Exploration / Budgeting / Cooking / Gardening/Landscaping / Conservation / Hobbies / Advertising / Fashion / Technology / Analogies / Arts

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Explore creative solutions given limited resources.
- Create alternative approaches to a task.
- Attempt new tasks or challenges with confidence.
- Manipulate media to create something new.

Middle School Demonstrators

- Use common things in uncommon ways to accomplish a task.
- Develop a plan for creative uses of limited resources.
- Use innovative ways to approach tasks.

High School Demonstrators

- Generate alternate and innovative approaches to problems; design and implement a plan of action; evaluate.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Portfolio Development, Performance Events/Exhibitions • **Problem Solving**: Inquiry, Creative Problem Solving, Future Problem Solving • **Technology/Tools**: Computers, Games, Manipulatives, Multimedia, Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Participate in a community action project.
- Serve as interns with local city planners regarding housing development.
- Invite design professionals (e.g., architects, landscapers) to discuss their projects and how they develop their ideas.
- Visit a factory to observe manufacturing and design techniques.

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Core Concept: Resourcefulness and Creativity

Sample Elementary Activities

- Build a bridge using newspaper, string, tape, and paper clips that will support a specific weight. Test to see if the bridge will support a specified weight and explain your findings. PE, OE
- Investigate games of the past. Adapt them for modern use and play the game with a friend. PE, OE, P
- Share a personal hobby at a hobby fair. Design the display to capture others' interest. PE, OE, P
- Write or use a word processor to compose a "how to" book. OE, P

Sample Middle School Activities

- Describe how you might use common items (e.g., a pocket knife, a compass, and a book of matches) to get out of the woods safely if you are lost. OE, P
- Design a multimedia survival manual to be presented by your class to an incoming class of students. PE
- Invent a recycling game. PE
- Select objects representative of your community and place in a 2'x2' time capsule. PE

Sample High School Activities

- Form a company whose profits will benefit a service organization, charity, or environmental group. Develop, produce, and market the product. PE, OE, P
- Identify a bioethical issue. Research the issue and prepare an informational pamphlet and presentation for your community. PE
- Set up a network via computer with schools in other parts of the country. Use databases and spreadsheets to accumulate and organize the data. PE
- Use a CAD program to illustrate a 3-dimensional model of a city block. PE

Reflections

Students of the future will need to be resourceful, creative, and able to generate alternative solutions to social and economic problems created by the demands of an expanding population. Finding resources, analyzing their relevance and then deciding on their best use will require not just analytic skills but creative ones as well.

To develop as resourceful and creative individuals, students need a learning environment that fosters risk-taking and innovation as well as explicit instruction in research and problem-solving.

Experience as a member of a problem-solving team in any discipline or setting fosters creativity by establishing a climate encouraging diversity and uniqueness. The development of an inquiring attitude and an ability to find what is needed helps the individual student generate alternatives, explore innovative approaches to tasks, and learn to make efficient use of limited resources.

Source: Torrence—The Search for Satori and Creativity

Goal 3: Become Self-Sufficient

Academic Expectation

3.5: Students demonstrate *self-control and self-discipline.*

Learning Links: Laws / Rules / Patience / Service / Empathy / Tolerance / Authority / Goal Setting / Compromise / Budgeting / Training / Conservation / Self-assessment

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Set and implement a personal short-term goal based on self-assessment.
- Demonstrate ways to constructively express feelings in a range of situations and/or with a variety of people.
- Explore the consequences of different behaviors and emotions.
- Identify issues/situations that impact self-control.

Middle School Demonstrators

- Set and implement a personal goal based on self-assessment.
- Demonstrate responsibility for personal behaviors.
- Examine the effect of peer pressure on personal behavior.

High School Demonstrators

- Set personal long-term goals; identify criteria; monitor and record progress; reassess and realign as needed.
- Demonstrate responsibility for personal behaviors.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Community-Based Instruction**: Service Learning, Mentoring/Apprenticeship/Co-op • **Continuous Progress Assessment**: Self-assessment, Checklist, Performance Events/ Exhibitions • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite representatives from agencies that deal with spouse and/or child abuse (e.g., Cabinet for Human Resources or Family/Youth Resource Center) to the class.
- Invite local animal warden or animal shelter director to talk regarding appropriate treatment of animals.

Core Concept: Self-Control and Self-Discipline

Sample Elementary Activities

- Interview a service employee on the importance of maintaining self-control on the job. Make a list of employee "do's and don'ts" for various jobs. PE, OE, P
- Develop specific and appropriate guidelines for special events (e.g., field trip, assembly, special projects). OE, P
- Develop a proposal for class rules, rewards, and punishments. Defend your proposal to your principal. PE, OE, P
- Choose an undesirable habit and develop a plan to change the habit (e.g., limit TV time, cutting back on candy consumption). Record progress over time. OE, P
- View television sitcoms or cartoons to discover characters who display self-control and self-discipline. Analyze the behaviors which are used. OE, P

Sample Middle School Activities

- View three different scenarios of events (e.g., activities at a museum tour, baseball game, or ceremony). Identify behavior that is appropriate or inappropriate for each event. PE, P
- Produce a video which demonstrates positive self-talk and incorporates music and visual images. PE, P
- Design a skit to depict a friend's influence on you to shoplift a pair of jeans. PE, P
- Design and implement a plan to improve your self-discipline (e.g., study habits, healthy lifestyle). PE, OE, P
- Brainstorm a class list of inappropriate forms of teasing. Compile the information and create a graph. Use a spreadsheet to display. PE

Sample High School Activities

- Keep a log of specific situations which cause personal difficulties. Categorize causes of each situation and personal behaviors exhibited. Include both short and long-term consequences. Develop a plan to exhibit self-control and self-discipline. OE, P
- Design a personal plan to assess correlations in your career plan, social life, and family obligations. Monitor, record, and reassess your plan over an extended period of time. OE, P
- Identify admired adults and interview them on how they maintain self-control and self-discipline in their lives. PE, P
- View a tape of a parent disciplining children or a teacher dealing with student discipline. Analyze what elements of self-control are maintained. Role-play alternative responses. PE, OE, P
- Create a multimedia program depicting alcohol and its effect on driving. PE, OE, P

Reflections

As education continues the shift from a teaching-centered activity to a learning-oriented process, the need for students to hone skills of self-control and self-discipline will become even more important. Many occurrences in the school day provide opportunities to develop and practice self-control and self-discipline.

When students set goals for their learning, take responsibility for their actions and monitor the results, they not only practice but learn these important qualities. The sample activities provide the freedom to choose, to make mistakes, to reassess and continue with programs and projects.

These qualities are not only important in the students' academic preparation but in their personal lives as well. Social relations in school and out are bound by standards of acceptable behavior and practice. Here again, students must be given the opportunity to exercise learned habits of self-control and self-discipline. Monitoring and accepting responsibility for their behavior will assist them in learning to make better choices in school and as responsible citizens.

Goal 3: Become Self-Sufficient

Academic Expectation

3.6: **Students demonstrate the ability to make decisions based on *ethical values.***

Learning Links: Peace / Morals / Politics / Medicine / Conflict Resolution / Religion / Environmental Awareness / Cultural Understanding / Honesty / Friendship / Non-Discrimination / Promises / History

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate ethical behaviors.
- Explore the similarities in ethical values of school, community, culture, and society.
- Recognize behavior/consequence based on ethical standards.

Middle School Demonstrators

- Demonstrate ethical behaviors.
- Clarify personal values.
- Make decisions based on ethical values and evaluate the consequences.
- Analyze the similarities in ethical values of school, community, cultures, and society.

High School Demonstrators

- Develop, utilize, and evaluate decisions based on ethical values.
- Apply a personal value system to a variety of situations.
- Recognize actions which influence personal beliefs.
- Make decisions based on ethical values and evaluate the consequences.
- Analyze ethical values from a variety of regional and global cultures.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Observation • **Problem Solving**: Case Studies, Future Problem Solving, Debate, Oral History, Research, Inquiry • **Technology/Tools**: Computers, Puppets • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite individuals from other cultures (or exchange students from other countries) to discuss similarities and differences in values of their societies.
- Invite a local community leader to discuss ethical values.
- Talk to a neighborhood representative (e.g., mayor, police officer, long-time resident) about unstated rules within the neighborhood.

Core Concept: Ethical Values

Sample Elementary Activities

- Create and present a play based on the theme: "Honesty is the best policy." PE, P
- Keep a journal on your thoughts and feelings about a current issue. P
- Collect examples from media which demonstrate personal ethics. PE, OE, P

Sample Middle School Activities

- Create a class court where students are held accountable for student-established class rules. PE, P
- Create and present a skit based on the theme "What Would 'You' Do If...?" PE, OE, P
- Choose an issue of global concern and debate from the perspectives of a United Nations member. PE, OE, P

Sample High School Activities

- Compare the values of diverse cultures on such issues as marriage and freedom of speech. Relate their evolution to historical events. OE, P
- Investigate the legality of living wills among several states. Interview attorneys, elderly people, or physicians. Develop a panel presentation of the information. PE, P
- Write and defend a law to govern technological advances (e.g., in vitro fertilization, access to computer files). PE, OE, P

Reflections

In this complicated world of high technology, ethical and moral dilemmas are compounded with every scientific breakthrough. Students face a world where doctors can replace vital organs to prolong life, but donors are so scarce that patients are put on priority lists; a world where farmers can sustain excess agricultural production in some regions, but resources are so scarce in others that people starve.

In order to become a contributing member of society, students need to understand both basic and complex societal needs; develop an appropriate personal ethical value system; and be able to examine, analyze, and arrive at decisions based on their personal values. In addition, these decisions should be examined in light of the accepted values of the culture in which they live.

This academic expectation cannot be divorced from the others which focus, for example, on self-control and self-discipline or positive self-concept. Virtually every moment in school provides students the opportunity to make choices which can reflect their self-sufficiency and ethical values. The demonstration of truthful and honest behavior becomes a habit which will serve students as they take their place in the world.

Source: Fogarty & Haack—Future World, Future School

Goal 3: Become Self-Sufficient

Academic Expectation

3.7: Students demonstrate the ability to *learn on one's own.*

Learning Links: Telecommunications / Hobbies / Goal Setting / Time Management / Extracurricular Activities / Learning Styles / Continuing Education / Self-Evaluation / Distance Learning / Training

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Assess personal needs and achieve personal learning goals.
- Use a variety of learning strategies (e.g., scanning, outlining, paraphrasing) to acquire, manipulate, use and evaluate information.
- Access appropriate resources for learning in school, home, and community.
- Identify distracters/barriers to the learning process.
- Discover multiple ways of learning.
- Develop personal interests.

Middle School Demonstrators

- Achieve multiple personal learning goals.
- Reflect on and assess one's own learning.
- Use learning strategies and resources that transfer to a variety of situations.
- Use personal interests as opportunities for independent learning.

High School Demonstrators

- Prioritize and achieve multiple learning goals.
- Reflect on and assess one's own learning.
- Pursue leisure time interests that promote personal growth.
- Use resources and personal learning strategies to enhance independent learning.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies, Service Learning • **Continuous Progress Assessment**: Self-assessment • **Graphic Organizers**: KWL, Notetaking, Outlining • **Problem Solving**: Research, Inquiry • **Technology/Tools**: Interactive Video, Distance Learning • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Meet with community artists, hobbyists, or professionals to determine how they stay current in their fields.
- Contact senior citizens groups to determine how they are involved in community education activities.

Core Concept: Independent Learning

Sample Elementary Activities

- Design and conduct a hobby survey. Present the results in a bar graph. OE, P
- Keep a journal of personal interest activities throughout the year and reflect on changing personal interests. P
- Use scientific methods to develop an independent science investigation. OE, P
- Work with a partner to develop two ways to learn a single concept. PE, OE, P

Sample Middle School Activities

- Research a personal interest using a variety of techniques (e.g., interview, survey, observation, experimentation) and document the process. Present to an audience outside of school. PE, OE, P
- Write a self-assessment of academic progress at the end of each grading period. Determine and implement plans for improvement. OE, P
- Design a learning styles inventory. Form study groups based on similar styles. PE, OE, P
- Evaluate your own physical fitness. Set goals for improvement and maintain an active record of your progress. OE, P
- Research occupations in the community to discover requirements for continuing education. P

Sample High School Activities

- Design a study environment that matches personal learning styles and preferences. PE
- Learn a new skill and evaluate your progress. PE, P
- Identify present interests and needs (e.g., school, family, friend, work) and develop a time management plan to maximize the time available. PE, OE, P
- Shadow an artist, professional, or hobbyist. Compare your interests and abilities with the adult you shadow. PE
- Tutor students in other grades or those with special learning needs. PE

Reflections

As teachers work to establish independent learners, they must help students become aware of the need to take control of their own learning. Then, and only then, are students able to think and behave independently and effectively. When students learn independently, they plan, monitor, and evaluate their own behavior.

Because technological, environmental, and economic changes are a life-long reality, students who can learn on their own can continually adjust to the changes in their lives and renew their skills. Activities which make students aware of expectations, help them strategize, and cause them to reflect on their work, reinforce their self-sufficiency and help them become leaders at school, at work, and in the community.

Notes

Transformations:

Goal 4

Become Responsible Group Members

Students at Northern Elementary in Scott County work together in a group. **Photo by Rick McComb.**

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Goal 4: Become Responsible Group Members

Academic Expectation 4.1: Students effectively use *interpersonal skills.*

Learning Links: Community Service / Support Groups / City Council / Salesmanship / Clubs / Friends / Mediation / Consensus / PTA/PTO / Teamwork / Compassion / Diplomacy

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Seek and demonstrate appropriate resolutions to conflict.
- Demonstrate an open mind to differing opinions and viewpoints.
- Interpret nonverbal behavior and respond in a non-threatening manner.
- Communicate a personal viewpoint verbally or nonverbally in a non-threatening manner.
- Listen and take turns speaking.

Middle School Demonstrators

- Practice mediation/facilitation skills to assist with conflict resolution and problem solving.
- Evaluate the impact of verbal and nonverbal behavior on others and adjust according to the situation.
- Express ideas in a non-confrontational manner.
- Demonstrate an open mind to differing opinions and viewpoints.
- Listen to others express their views.

High School Demonstrators

- Express views in a sensitive, non-confrontational manner and consider views of others.
- Use mediation/facilitation skills to assist with conflict resolution and problem solving.
- Demonstrate appropriate verbal and nonverbal skills to resolve controversy.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction**: Mentoring, Networking, Service Learning, Shadowing • **Continuous Progress Assessment**: Conferencing • **Problem Solving**: Debate, Case Studies, Interviews, Role-play • **Technology/Tools**: Games, Puppets, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a professional mediator to develop a role-playing situation involving conflict resolution. Apply mediation principles to real-life conflicts in your school.
- Observe a local dance or theater presentation. Discuss ways in which nonverbal communication is used in these presentations.
- Interview local police officers to determine how mediation is used in their daily activities.

Core Concept: Interpersonal Skills

Sample Elementary Activities

- Develop and implement a classroom behavior code. PE, P
- Role-play an argument between two classmates and include the intervention of a mediator. Discuss the role of the mediator. Identify alternative solutions to the situation. PE, OE, P
- Role-play different reactions to situations using no words. Determine how actions show feelings. PE, OE, P
- Keep a log of other people's actions that bother you. Generate a list of most frequently listed actions and propose alternative behaviors. PE, P

Sample Middle School Activities

- Watch a television sitcom and analyze the conflict resolution strategies. PE, P
- Observe people at a local shopping center and record the nonverbal behaviors; communicate the effectiveness/ineffectiveness of the behaviors. P
- Choose a historical event. Describe or illustrate how the individuals involved dealt with the situation. Identify how history might have changed if different interpersonal skills had been used. P
- Develop and implement a buddy program for new students enrolling in your school. PE, P

Sample High School Activities

- Develop and distribute a survey about issues encountered by dating couples. Analyze the data collected and publish the results. P
- Role-play characters in a crisis which may have been caused by human judgment (e.g., The Alaskan Oil Spill). Present all sides of the issue to an arbitration team to settle the social and economic responsibilities of the parties. PE, OE, P
- Attend a court session involving a civil suit. Listen and record different viewpoints. Develop a proposal to solve the problem presented. PE, OE, P
- Survey local marriage counselors, police departments, and social workers to determine the leading causes for conflicts in marriages. Research alternatives for preventing and/or resolving these conflicts. Create a discussion group for students in the school considering marriage. Use the information about marriage conflicts in the discussion groups. PE, OE, P

Reflections

Students who develop their skills in dealing with others increase their options in school, in the workplace, in family relationships, and in friendships.

Students who learn to listen, show sensitivity, and exhibit appropriate behavior with others are successful in both formal and informal settings. They become more valued as members of a group and are appreciated for their ability to give constructive feedback, and resolve conflicts in a non-confrontational manner. They also become aware of the effect of their behavior on others and can alter behavior to increase communication.

As students improve their interpersonal skills, they can transfer this knowledge and ability to any aspect of their lives, using the skills to resolve conflicts in a nonviolent manner, or foster communication and harmony in relationships.

Goal 4: Become Responsible Group Members

Academic Expectation **4.2:** Students use *productive team membership.*

Learning Links: Committees / Juries / School Board / United Nations / Church Groups / EMS / Clubs / Academic Teams / Support Groups / Sports / Firemen / Quality Circles / Police / Student Council / PTA/PTO

Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use effective team skills to complete a group task.
- Determine personal strengths as related to a group task.
- Explore roles and responsibilities of team members.
- Identify skills needed to work effectively in a group.
- Share tools and help each other to work cooperatively on a task.

Middle School Demonstrators

- Monitor and assess group progress toward a goal and make appropriate adjustments.
- Analyze the effects of beliefs and feelings on group effectiveness and productivity.
- Use effective team skills to complete a task.
- Assess strengths of group members and decide appropriate roles to accomplish a task.

High School Demonstrators

- Use effective team skills to accomplish a variety of tasks.
- Monitor and evaluate personal team membership skills and make appropriate adjustments for increased productivity.
- Demonstrate skill as a team leader and a group member.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Reciprocal Teaching • **Community-Based Instruction**: Field Studies, Networking • **Continuous Progress Assessment**: Performance Events/Exhibitions • **Problem Solving**: Debate • **Technology/Tools**: Games, Puppets, Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section

Ideas for Incorporating Community Resources:

- Visit a hospital in your community or region and observe work teams in action.
- Invite local police officers and firefighters to present information on how they work as team members.
- Visit or conduct research on a business operating in Kentucky that practices team philosophy.

Core Concept: Productive Team Membership

Sample Elementary Activities

- Plan a field study. Assign tasks and responsibilities (e.g., correspondence, budget, transportation). Implement the plan. PE, OE, P
- Form teams to plan and construct a mural depicting a current theme. PE
- Observe others playing a game. Note the personal strengths of the members. OE, P
- Develop an evaluation tool to use in assessing a videotaped group performance. OE, P

Sample Middle School Activities

- Develop and use a rubric to monitor group process skills. PE, OE, P
- Conduct mock trials with 4-6 person juries. Reflect on the roles of individuals to the group task. PE, OE
- Observe a formal meeting. Classify productive and nonproductive group behaviors. Recommend strategies for improved team efficiency. PE, OE
- Form a team to create solutions to problems which are caused by a social issue affecting your school or community. PE, OE

Sample High School Activities

- Shadow a health care team. Evaluate individual contributions to the team effort. PE, P
- Organize a team to plan and implement a community service project. PE
- Develop criteria to evaluate an individual's contributions to a club or team. OE, P
- Form support groups to address issues which impact students in your school. PE

Reflections

Starting with membership in the family and continuing to a number of memberships in adulthood, every individual is a member of a variety of formal or informal groups. Membership frequently occurs simultaneously in several groups as students participate in athletic teams, join church youth groups, take part in a class play, or serve in a community volunteer agency.

Success as a member of any group depends on a person's ability to apply the skills required of a responsible team member. A student must be able to recognize personal strengths and weaknesses and use them to contribute to a balanced group. Successful groups are composed of both leaders and nonleaders who cooperate to achieve group goals and produce a valued product.

It is important for students to develop the ability to approach class projects and requirements as a responsible group member, and monitor and assess group progress. Working as a member of a team increases achievement and self-esteem and can make a critical difference in forming student attitude about school and school success.

Goal 4: Become Responsible Group Members

Academic Expectation 4.3: **Students individually demonstrate *consistent, responsive, and caring behavior.***

Learning Links: Peace Corps / Animal Rights / Service Occupations / Charity / Service Learning / UNICEF / Baby-sitters HIV/AIDS/STDs / Blood Drives / Parenting / Police / Hospice / Public Health / Homeless

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate concern for and respond to a need of an individual, family, and/or group.
- Recognize consequences of actions.
- Recognize the strengths and needs of self and others.
- Share and help others on a task.

Middle School Demonstrators

- Find a real-life problem; determine possible solutions and implications; implement a plan.
- Use personal strengths to respond to a need.
- Assume responsibility for behavior in social situations.

High School Demonstrators

- Find a real-life problem; determine possible solutions and implications; analyze results in terms of its impact.
- Demonstrate personal concern and commitment for the welfare of others.
- Assume responsibility for behavior in response to environmental and social needs.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Community-Based Instruction**: Field Studies, Mentoring/ Apprenticeship/Co-op, Service Learning • **Continuous Progress Assessment**: Anecdotal Records • **Problem Solving**: Role-play • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Volunteer time to a community agency (e.g., local animal shelter, homeless shelter, soup kitchen, Salvation Army).
- Invite the director of a service agency to discuss how students could be used to help deliver services.
- Work with a community agency on a project to provide warmth and comfort to the poor and the elderly (e.g., collect winter coats, conduct a drive for donations of heaters).

Core Concept: Consistent, Responsive, and Caring Behavior

Sample Elementary Activities

- Form a "care" committee for sick classmates. PE
- Write/draw a self-portrait showing personal strengths and needs. P
- Make a collage to show people demonstrating caring behaviors. PE
- Adopt a senior citizen. Respond to their needs through correspondence and visits. PE, P

Sample Middle School Activities

- Participate in community service projects (e.g., Habitat for Humanity, animal shelter, Red Cross blood drive). PE
- Compile a database of available community service organizations for families. Distribute the file to local business and public agencies. PE, OE, P
- Initiate a reading partnership with elementary students. PE
- Plan, create, and maintain a bird sanctuary. PE

Sample High School Activities

- Create a crisis response team to address local or national disasters. PE, P
- Develop a school action plan and make a multimedia presentation to the school council. PE, OE, P
- Develop and implement a service learning project which incorporates individual interests and community needs. PE
- Establish a tax preparation service for the community. PE
- Implement an "adopt-a-highway" program. PE

Reflections

When students take risks and are rewarded with support and encouragement from other group members, the overall effectiveness of the group is enhanced. Encouraging students to work together is vital in developing individuals who are concerned with one another. Students begin to consider consequences of their actions and take responsibility for them.

Even though our society pays homage to competitiveness and a single winner of an event, a large measure of our success as a nation is the result of cooperation among individuals who care about each other. Being able to recognize when another person needs help, and then responding to that need is an important part of maintaining an attitude of concern and caring for others. Students who learn to care about each other in school will be more likely to extend that caring all through their lives.

Goal 4: Become Responsible Group Members

Academic Expectation **4.4:** **Students demonstrate ability to accept the *rights and responsibilites for self and others.***

Learning Links: Voting / Laws / Conflict Resolution / Human Rights / Politics / Contracts / Police / Community Service / Constitution / Treaties / Arbitration / Privacy / Neighborhood Watch

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate the ability to compromise.
- Assume responsibility for personal behavior.
- Recognize the right to disagree in an appropriate manner.
- Recognize and respect individual differences.
- Recognize the reasons for rules and laws.
- Identify rules and laws in daily life situations.

Middle School Demonstrators

- Demonstrate the ability to negotiate and compromise.
- Engage in behaviors which respect the rights of others.
- Recognize actions that jeopardize or violate individual rights.
- Analyze relationships between rights and responsibilities.
- Assume responsibility for personal behavior and analyze its effects on others.

High School Demonstrators

- Demonstrate the ability to recognize and respect individual differences; practice mediation; compromise and negotiate.
- Exercise the right to disagree appropriately with authority, rules, and regulations.
- Analyze relationships between power and authority, rights and responsibilities.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Community-Based Instruction**: Field Studies, Service Learning, Shadowing • **Continuous Progress Assessment**: Checklist • **Problem Solving**: Case Studies, Debate • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a member of the League of Women Voters to discuss the history of voting rights for women, minorities, and Native Americans in the United States.
- Interview an attorney with the American Civil Liberties Union to determine his/her role in the community.
- Meet with a professional negotiator to discuss the various aspects of mediation.

Core Concept: Rights and Responsibilities

Sample Elementary Activities

- Role-play a variety of responses to authority figures. PE
- Debate a controversial issue, break into groups afterward and discuss the appropriateness of your behavior during the debate. PE, OE
- Develop a rule book for personal behavior on the school playground. P
- Develop a musical presentation showing efforts to protect an individual's rights. PE
- Create a poster illustrating a specific law which has implications for your daily life. PE
- Create a comic book where a superhero protects the rights of others. OE, P

Sample Middle School Activities

- Hold trials for historical leaders accused of abusing their power. PE, OE
- Produce a video to explain the school rules. PE, OE
- Plan and implement a peer mediation program. PE, OE
- Log personal interactions that demonstrate respect and disrespect for the rights of others. Form a plan to change the negative interactions to positive. P

Sample High School Activities

- Research times when civil disobedience has caused change. Draw relationships with current issues. OE
- Conduct a survey of eligible voters to determine who is registered and establish a database of the information. Based on an analysis of the results, organize a voter registration drive. PE, OE, P
- Prepare a public service announcement to support participation in jury service. PE, OE, P
- Organize a neighborhood watch. PE

Reflections

Students are often eager to declare their rights but not always as quick to take responsibility for their actions. Learning to function as a responsible member of a group involves taking initiative to see that rights and responsibilities are kept in balance for all members of the group, regardless of mental, gender, racial, physical, cultural, or other differences.

Students must come to consensus about what rights are valued, how they are guarded, and what responsibilities accompany those rights. In coming to the agreement, students must realize that there is give as well as take, and that the success of a group is the responsibility of each member.

As a member who helps to develop the rules by which the group operates and is held responsible for some of the actions of a group, a student has an opportunity to make decisions about authority and participation. One of the components of responsible group membership also entails learning how to disagree with the group and learning how to disagree with or challenge authority in appropriate ways.

Goal 4: Become Responsible Group Members

Academic Expectation

4.5: **Students demonstrate an understanding of, appreciation for, and sensivity to a *multicultural and world view.***

Learning Links: Music / United Nations / Multi-National Corps / Olympics / Free Trade / Spaceship Earth / Customs/ Rituals / Urban/Rural Issues / Historical Perspectives / Immigration/Emigration / Prejudice / Satellite TV / World Court

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Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

- Interact effectively with a variety of people (e.g., gender, ethnic).
- Describe cultural similarities, differences, and contributions.
- Recognize the uniqueness of individuals and cultures.

- Analyze the effects of interdependence on a global society.
- Interact effectively with people from different backgrounds.
- Analyze cultural similarities, differences, and contributions.

- Analyze the influence of diverse cultures and traditions on events (past and/or present).
- Interact effectively with people of different cultures and views.
- Analyze community and global concerns in terms of multicultural perspectives.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies, Mentoring/Apprenticeship/Co-op, Networking, Service Learning, Shadowing • **Continuous Progress Assessment**: Conferencing • **Problem Solving**: Case Studies • **Technology/Tools**: Distance Learning, Puppets, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Research and/or invite community persons to discuss different cultures (e.g., different holidays and their unique celebrations, different meals and their significance).
- Survey local businesses for multicultural products.
- Visit different cultural organizations (e.g., churches, community centers, associations).

Core Concept: Multicultural and World View

Sample Elementary Activities

- Develop a collage of your family depicting lifestyle and traditions. Compare with other collages in the class. PE, OE
- Investigate the cultural origins of your favorite holiday food. Prepare the food and explain your findings. PE, OE, P
- Make a presentation which demonstrates a cultural tradition different from your own. PE, OE, P
- Create a book which compares life in your own country to that of another country. Use both word processing and graphic features of the computer in completing the book. PE, OE, P

Sample Middle School Activities

- Choose a regional culture and develop a travel brochure to promote the culture. PE, OE
- Investigate your cultural heritage and create a multimedia presentation. PE, P
- Publish a guide which includes pictures and captions of buildings in your community which represent the influence of different cultures. PE, OE, P
- Design a mural for the school hallway showing the culture of the local area. PE, OE

Sample High School Activities

- Identify various cultures represented in your community and work with them to plan a local "heritage day." PE
- Prepare a multimedia presentation which shows the influence of various cultures on the United States. PE, OE, P
- Volunteer to assist immigrants or non-English speaking people in a variety of activities (e.g., filling out forms, acting as translator). PE
- Prepare a multimedia exhibit which shows local history, people, and culture. PE, OE

Reflections

It is estimated that a young person entering the job market can expect to change jobs at least five times over the span of a career. Most students today will move approximately 10 times, at least once to a location over 500 miles away. Most people will live in a metropolitan area during part of their career. The world has become far too interdependent to accommodate intolerance of those from backgrounds which are different from our own.

Given the mobile nature of the modern world, students must learn to understand and appreciate contributions from other cultures. Students will benefit greatly from a global perspective, a broad view that accepts the subtle and the obvious differences among people. Cultural diversity within a school may include variety in the ethnic, economic, religious, or racial makeup of the student body. Even if there is not great diversity in the student body, it is probable that students will spend part of their life in a culturally diverse group.

This diversity in culture contributes different points of view and perspectives to each situation. Students need to develop an appreciation of diversity, and communicate and interact with persons of different backgrounds. Acknowledging the contributions of diverse cultures and being able to work with members who hold different value systems becomes an essential quality of responsible group membership.

Goal 4: Become Responsible Group Members

Academic Expectation

4.6: Students demonstrate an *open mind to alternative perspectives.*

Learning Links: Journalism / Religions / Customs / Conflict Resolution / Discovery / Democracy / Multimedia / Arts / Political Debate / Second Language / Blindness / Urban/Rural / Respect

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Demonstrate tolerance for differing viewpoints.
- Analyze an issue or event from another perspective.
- Listen and take turns speaking.

Middle School Demonstrators

- Investigate and defend alternative views and perspectives on an issue.
- Demonstrate behaviors which show respect for divergent opinions.
- Encourage others to expand and develop their ideas.

High School Demonstrators

- Collaborate to expand and develop ideas.
- Analyze factors (e.g., prejudice, age, socioeconomic, culture) which influence perspectives and evaluate the impact.
- Express views in a non-confrontational manner.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Interviews • **Problem Solving**: Brainstorming, Questioning, Debate, Oral History, Research, Role-play • **Technology/Tools**: Puppets, Video • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Organize a discussion panel of individuals from different communities or areas within the community to discuss current events from their viewpoint.
- Invite a reporter to discuss writing a story based on the evidence of several witnesses.
- Meet with a local police officer to discuss the impact of differing perspectives on their work.

Core Concept: Open Mind to Alternative Perspectives

Sample Elementary Activities

- Tell the story of Cinderella from the stepmother's perspective. OE, P
- Select an object in the classroom; illustrate or photograph it from three perspectives. Compare the different views. PE, OE, P
- Have three friends look at a picture and give separate descriptions. Compare the descriptions and choose the one which best explains the picture to you. OE
- Select an argument between yourself and a friend or sibling. Identify the varying viewpoints and analyze the argument from both sides. OE, P

Sample Middle School Activities

- Find an illustration, photo, or painting of a historical event. Portray the event from the perspective of a person or object shown. PE, OE, P
- Select musical works from two different cultures or periods which illustrate the same emotion or idea. OE
- Demonstrate to a younger student a variety of ways to define and represent a math problem using manipulatives, examples, or illustrations. PE, OE, P
- Produce a video book on the American Revolution from the viewpoint of the British. PE, OE, P

Sample High School Activities

- Research accounts of the same event from three different sources. Describe how the differences in the accounts could lead to different interpretations. OE, P
- Hold a mock debate about historical controversies with students playing the roles of those involved. PE
- Read the original or a translation of a foreign language newspaper account of a controversial action by the United States. Discuss the issue from both sides and negotiate a compromise. PE, OE, P
- Read Twelve Angry Men. Working in a group, analyze the factors which influence the perspective of each juror. PE, OE

Reflections

At the heart of responsible group membership is an openness to ideas; a willingness to consider alternatives; and a predisposition to view a theory from different perspectives. In the small group process, members investigate an idea, present an opinion, advocate that opinion, and support it with details and evidence. Also, in this group process, conflicts arise and members defend and justify their stands. And, in the settlement of these disputes, students learn tolerance; they learn to compromise; they learn to seek consensus and reunify the group position—all of which require an open mind.

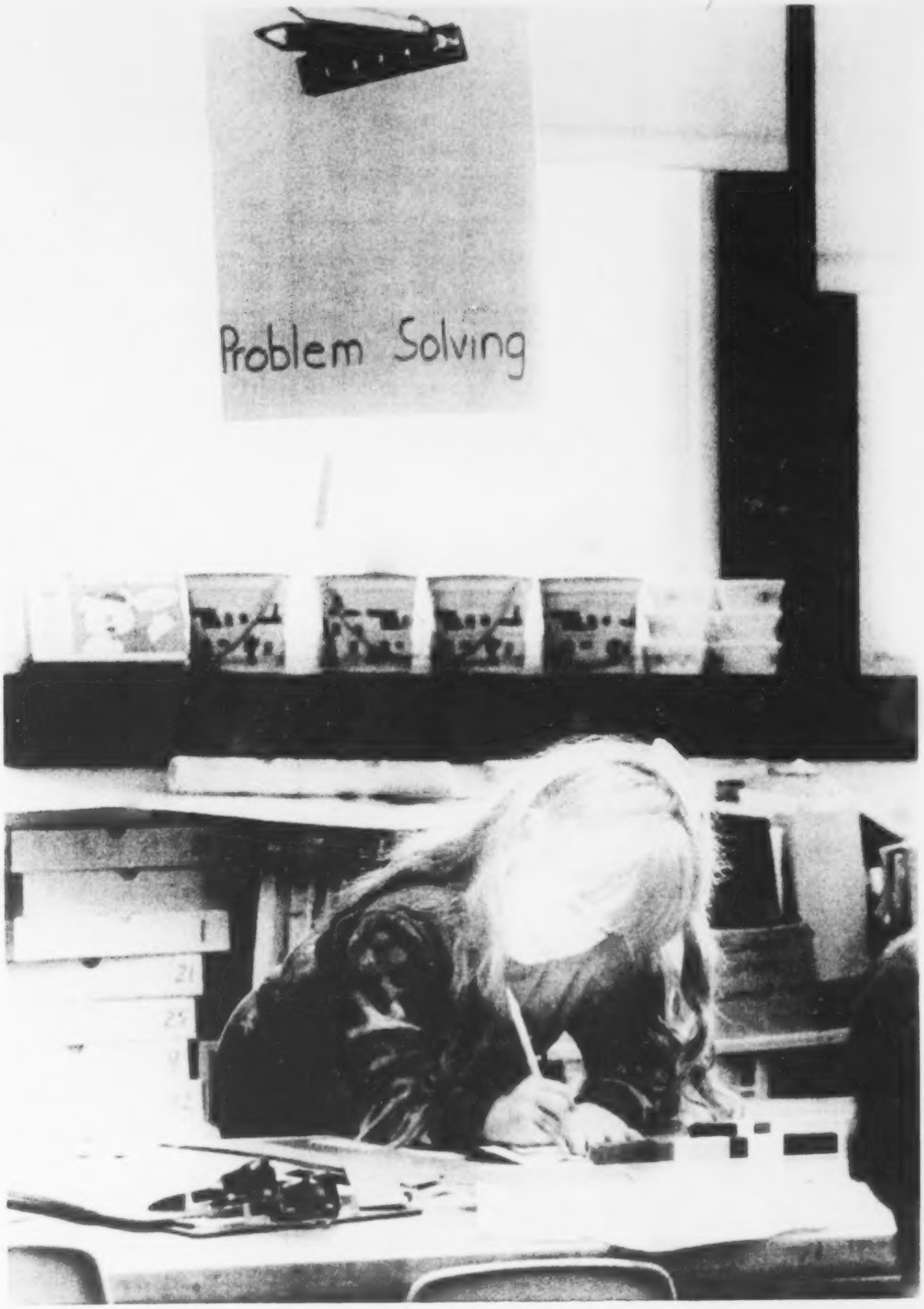
People naturally have biases. They are inclined to particular points of view depending on their values, beliefs, and customs. The purpose of this academic expectation is to make students aware of their personal perspectives while also recognizing that there are other ways to look at things. Once aware of the differences, students can be more open to and tolerant of opposing ideas.

Notes

Transformations:

Goal 5

Think and Solve Problems


Problem Solving

Student at work at Arlington Elementary in Fayette County. **Photo by Rick McComb.**

Goal 5: Think and Solve Problems

Academic Expectation 5.1: Students use critical thinking skills such as analyzing, prioritizing, categorizing, evaluating, and comparing to solve a variety of problems in real-life situations.

Learning Links: Investigation / Legislation / Legal Opinions / Construction / Experiments / Computer Programming / Inventions / Jury Decisions / Chess / Conservation / Strategic Planning / Consumerism

Elementary Demonstrators

- Form and defend an opinion based on multiple perspectives.
- Examine cause-and-effect relationships.
- Recognize sequential relationships.
- Classify ideas/objects/situations into categories.
- Discover patterns in life situations.

Middle School Demonstrators

- Generate possible solutions to problems; predict effects of actions.
- Analyze cause-and-effect relationships.
- Analyze information for bias/ relevance/ambiguity.
- Examine ideas/objects/situations for patterns; discern discrepancies.

High School Demonstrators

- Propose solutions to problems; predict effects of actions; set priorities; act; evaluate effectiveness.
- Analyze assertions for bias/ relevance/assumptions.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Graphic Organizers: Compare/Contrast Structures, Flowchart, Mapping/Webbing, Matrix, Venn Diagram • **Problem Solving**: Heuristics, Inquiry, Formulating Models, Research • **Technology/Tools**: Manipulatives, Games • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Ask a state trooper or local attorney to discuss the investigation and mediation process of auto accidents where both parties believed they were not guilty.
- Interview city commission members about how they make decisions.
- Meet with local loan officers to obtain information on the process for determining loan eligibility.
- Interview a number of agribusiness representatives about the process for determining the kinds of crops and livestock to raise.

Core Concept: Critical Thinking

Sample Elementary Activities

- Conduct a jury trial based on an incident from a story you are reading. Investigate how different perspectives change the outcome. PE, OE
- Investigate the causes of accidents on the playground. Propose solutions to reduce the accidents. PE, OE
- Design a new multimedia learning center for your classroom. Develop a plan to implement the center and present to your classmates. PE
- Invent new rules for a favorite game. Analyze how this changes the game. PE, P

Sample Middle School Activities

- Present a skit to depict the problems a family might have if a particular appliance were removed from the house. Generate possible solutions and predict the effects. PE, OE
- Investigate the use of all paper products in your school. Propose conservation measures. PE, OE
- Write, dramatize, and videotape a mystery with alternative endings. Select the most plausible ending and defend. PE, OE, P
- Analyze cafeteria food for fat and sugar content. Compile the information using a database. Compare with recommended levels. Make suggestions to the cafeteria manager. PE, OE, P

Sample High School Activities

- Distinguish the benefits and limitations of different forms of government (e.g., democracy, socialism, communism). Develop a political cartoon or comedy routine about a benefit or limitation. PE, OE, P
- Choose two media sources. Analyze the bias of each type of news. Write an article to be presented by each source (e.g., radio, newspaper). PE, OE, P
- Select an invention of the Industrial Revolution. Determine what expected and unexpected effects resulted from the invention. PE, OE
- Research the major issues of a year and present a "State of the Union" address. Compare to the actual address. Defend the changes in your address. PE, OE, P

Reflections

This academic expectation focuses on the ability of students to think critically; to analyze, synthesize and evaluate. It is a skill which should be embedded in solving any problem or making any judgment.

The learning goals and academic expectations of KERA require that we rethink the idea of focusing on isolated bits of information. The teaching of facts and theories may not be as important as the development of critical thinking skills which can be applied to any content or idea in the discipline. For example, in science, where new "facts" are added to the knowledge base everyday, it is crucial that students learn how to "sort sense from nonsense," or have the ability to grasp information, examine it, evaluate its soundness, and apply it.

The development of sound critical thinking skills produces students and citizens who can approach situations in school and life with the ability to make sound decisions and wise choices.

Source: Ennis—Evaluating Critical Thinking

Johnson, Johnson and Smith—Active Learning: Cooperation in the College Classroom

Paul—Critical Thinking Handbooks, Volumes 1-4

Goal 5: Think and Solve Problems

Academic Expectation

5.2: **Students use creative thinking skills to develop or invent novel, constructive ideas or products.**

Learning Links: Designs / Inventions / Think Tanks / Technology / Advertising / Brainstorming / Creative Arts / Humor / Toys/Games / Theatre Sets/Costumes / Theatres

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Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary

- Create a new solution or idea.
- Expand and analyze ideas and products.
- Generate a variety of ideas and products.

Middle School

- Assess newly generated solutions/ideas/products to test validity and utility.
- Create a new solution/idea/product.
- Generate, expand, and analyze ideas and products.

High School

- Analyze the process used to develop the newly generated solutions/ideas/products.
- Assess newly generated solutions/ideas/products to test validity and utility.
- Generate, expand, analyze, and create ideas and products using a variety of resources.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Portfolio Development, Performance Events/Exhibitions, Observation • **Graphic Organizers**: Graphic Representations, Mapping/Webbing, Storyboard • **Problem Solving**: Research, Creative Problem Solving, Future Problem Solving, Debate, Formulating Models, Role-play, Simulation, Brainstorming • **Technology/Tools**: Manipulatives, Computers, Interactive Video, Multimedia, Videotaping • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite local inventors to discuss their approaches to inventions.
- Invite a local artist, craftsperson, or graphic designer to discuss the creative process.
- Participate in Odyssey of the Mind, science fairs, Imagination Celebration, or Invent America.
- Interview local writers to learn how they generate ideas.

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Core Concept: Creative Thinking

Sample Elementary Activities

- Create a mobile or sculpture using recyclable products. PE
- Create a suggestion box for school issues. Select the most novel and constructive. Plan a campaign to implement the suggestion. PE, OE, P
- Explore products made in your community; analyze how these impact the community; propose ways to improve the product. PE, OE

Sample Middle School Activities

- Brainstorm ideas and generate low cost, efficient proposals to increase the community's access to exercise activities. PE, OE, P
- Create a moving sculpture to represent an idea. PE, OE
- Design a print or video advertisement for your favorite book or song. PE, OE

Sample High School Activities

- Use MIDI interface, graphics, hypermedia sound, or art tools to create images and ideas. PE
- Develop and implement hands-on approaches to teach science concepts to elementary students. PE, OE, P
- Develop and present for a school-based council a "state of the school" address which focuses on an aspect of the school's programs. Include suggestions for new programs or revisions for old ones. PE, OE, P

Reflections

Young children are naturally curious and creative. They play and use their imaginations in wonderful ways creating friends, monsters, and heroes. They love music and dancing. Their enthusiasm and excitement know no bounds. Traditional approaches to education often squelch that "joie de vivre."

Why should we foster creative thinking throughout a student's education? Creative thinkers are the inventors, poets, and explorers of our heritage. It is they who have given us Velcro, Post-It Notes, and "The Moonlight Sonata." Without the products of creative thinkers, we would dwell in caves without fire or drawings to remind us of the hunt, and our lives would be untouched by the spark of their creativity.

Goal 5: Think and Solve Problems

Academic Expectation

5.3: Students organize information to develop or change their understanding of a concept.

Learning Links: Models / Networking / Statistics / Budgets / Databases / Experiments / Reporting / Composition / Research / Index / Directory / Schedules / Choreography / Census

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Elementary Demonstrators

Middle School Demonstrators

High School Demonstrators

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use data to modify, develop, and test concepts.
- Identify connections between new information and prior knowledge.
- Gather, sort, and re-sort information into categories.
- Classify objects by characteristics.

Middle School Demonstrators

- Develop and test concepts based on new information and experience.
- Analyze the connections between new information and prior knowledge.
- Organize information into categories.
- Gather information from multiple sources to derive meaning.

High School Demonstrators

- Synthesize information to form a new concept and/or modify an old concept; test the concept with new information and modify.
- Assess the interrelationships between theories and concepts.
- Analyze a concept to extract and identify supporting components.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Peer Tutoring • **Continuous Progress Assessment**: Portfolio Development • **Graphic Organizers**: Compare/Contrast Structures, Graphic Representations, Mapping/Webbing, Matrix, Storyboard, Story Map, Venn Diagram • **Problem Solving:** Formulating Models, Creative Problem Solving, Future Problem Solving, Debate, Simulating • **Technology/Tools**: Manipulatives, Computers, Games, Interactive Video, Multimedia, Puppets • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a computer programmer to discuss how information can be organized for different purposes.
- Contact Junior Achievement and the Kentucky Council on Economic Education for information on marketing programs.
- Interview a local reporter about gathering and organizing information to develop an idea for a news report.
- Visit a manufacturing plant to discuss its process for developing new products.

Core Concept: Conceptualizing

Sample Elementary Activities

- Redesign your classroom to make it more efficient. PE
- Publish a school directory of hobbies. Form networks of similar interest. PE, OE
- Design a new box for a favorite cereal so that it would more likely to be bought by your peers. PE, OE
- Read a book and watch the movie version of it. Analyze how the two types of media support different understandings of the concepts. OE, P

Sample Middle School Activities

- Design and make a model of a city which includes a transportation network, emergency services, facilities, parks, and utilities (e.g., water, sewer). PE, OE
- Create a display for the school cafeteria based on a conservation theme. PE, OE, P
- Create a database of community artists/crafts people. Provide a variety of classification schemes to assist someone who uses the database. PE, OE, P
- Design a storyboard of a favorite story for an elementary classroom. PE, P

Sample High School Activities

- Analyze a local schoolyard or park for common plant and animal species. Make a model or other representation of what the area might look like in the year 3000 if ozone depletion, global warming, and increased ultraviolet radiation become realities. Explain your representation in terms of the concepts of adaptation, succession, and evolution. PE, OE, P
- Write and perform a play called "You Are What You Eat." Convey the concepts and relationships among diet planning, exercise, weight gain or loss, and calorie intake/utilization. PE, OE, P
- Choose a political system issue or philosophy and trace the underlying structures and principles which support it. Dramatize the development process. PE, OE, P
- Use a CAD program to create a building to meet specific zoning requirements. PE

Reflections

Being able to see a larger perspective, rather than just a small piece of the whole, enables students to see the relevance of their work. To focus constantly on the pieces, rather than how they fit together, is frustrating to both teacher and student.

The ability to take abstract ideas, reflect on them and then organize them in some manner to see how the parts relate to one another is the basis for conceptualizing. Students who master the ability to think conceptually are able to solve problems and make decisions which will not only have beneficial effects on their time in school, but also help them select careers from wider ranges such as mathematics, music, medicine, or another field based upon the aptitudes.

Goal 5: Think and Solve Problems

Academic Expectation 5.4: Students use a decision-making process to make informed decisions among options.

Learning Links: Career / Editing / Consumerism / Planning / Voting / Marriage / Jury Decisions / Legislation / Offense/ Defense / Censorship / Feedback / Logic / Diagnosis

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Analyze alternatives; make a decision.
- Predict consequences for solutions.
- Define a goal, gather information, and generate alternative solutions.
- Make a decision from given options.
- Identify daily decisions.

Middle School Demonstrators

- Monitor the effectiveness of a decision over time.
- Analyze and prioritize alternatives; select and defend a decision.
- Predict consequences for solutions and establish evaluative criteria.
- Recognize options; gather information; propose alternative options.

High School Demonstrators

- Choose and defend an option; make a decision; monitor and adjust the effectiveness of a decision over time.
- Predict and analyze consequences of options.
- Recognize options; gather information; propose alternative options.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Community-Based Instruction:** Mentoring/Apprenticeship/Co-op, Service Learning, Shadowing • **Continuous Progress Assessment**: Portfolio Development • **Graphic Organizers**: Advance Organizers, Compare/Contrast Structures, Flowchart, KWL, Outlining, Sequence Chain, Time Line, Storyboard, Mapping • **Problem Solving**: Inquiry, Heuristics, Brainstorming, Case Studies, Future Problem Solving, Debate, Interviews/Surveys/Polls • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Communicate with professors of philosophy about the role of logic in decision making.
- Invite a local physician to discuss decisions about diagnosis and treatment.
- Observe a local planning meeting to see how decisions are made.

Core Concept: Decision Making

Sample Elementary Activities

- Keep a journal for one week, noting decisions you made. Compile into a database of class decisions. Analyze alternative solutions which were made and could have been made. OE, P
- Establish a personal criteria for your toys. Evaluate the toys you currently want, using the criteria. Prioritize your list. OE, P
- Develop a list of books to purchase for your classroom. Consider your interest and those of your classmates. OE, P

Sample Middle School Activities

- Design a landscape plan for the entrance area to your school. Explain the decision for selecting the plants and their placement. PE, OE
- Research the position of two political candidates on an important issue. Determine which one to support and defend your choice. OE, P
- Investigate a variety of resources to develop criteria for making the best buy of a product you want. Apply the criteria in making the purchase. Evaluate your decision-making process to determine if you really made the "best buy." PE, OE
- Develop a weekly budget based on a given amount of money. Decide how much money is required to cover the expenses of lunch, school supplies, and extras. Use the budget for a week and evaluate the effectiveness of your budgeting decisions. PE, OE, P

Sample High School Activities

- Decide what kind of computer and software to purchase for your home which will interface with school technology and your projected needs. Create a priority purchasing plan based on budget and use. PE, OE, P
- Research the ingredients in several of your favorite "junk foods." Analyze the health effects of these ingredients, develop a priority chart of pleasures and risks involved in eating each food, and decide whether or not to continue eating it. Explain your choices in a piece developed for a portfolio. PE, OE, P
- Research the programs offered by several post-secondary institutions. Develop criteria to evaluate the institutions. Contact personnel at the institution, current and former students, and community people with knowledge about the institution. Use the information gathered and criteria developed to decide which institution to attend. PE, OE, P
- Establish guidelines for selecting an automobile insurance company and decide on a company with which to insure your vehicle. Create criteria for judging your decision and evaluate it at regular intervals. PE, OE, P

Reflections

According to Costa, intelligent behavior is knowing what to do when you don't know what to do. It's understanding the issue, its consequences, the alternatives, and then making the best decision. Students need practice in making meaningful decisions that require mindful analysis of all the options.

Good decision making is a process that includes critical thinking, creative thinking, and conceptualizing. Students who are able to incorporate these elements in the decision-making process will benefit from good decision-making skills in consumerism, voting, education, marriage, and work choices.

Source: Costa—The School as a Home for the Mind

Goal 5: Think and Solve Problems

Academic Expectation

5.5: Students use problem-solving processes to develop solutions to relatively complex problems.

Learning Links: Crime / Deficit / Racism / Mysteries / Legislation / Scheduling / Diagnosis / Budgets / Crisis / Conflict Resolution / Conservation / Technology / Planning/Design

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Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Choose a solution; evaluate the effectiveness of solution.
- Consider alternative solutions to a problem.
- Explore strategies to solve a problem.
- Gather and organize information on a problem.
- Identify a problem.

Middle School Demonstrators

- Apply criteria to alternative solutions.
- Establish evaluative criteria for testing alternative solutions.
- Identify alternative solutions to a problem.
- Define a problem; gather and organize information about the problem.

High School Demonstrators

- Implement a solution; evaluate its effectiveness; monitor and adjust as needed.
- Justify the strategy and solutions, based on the evaluative criteria.
- Establish and apply evaluative criteria for testing alternative solutions.
- Gather and organize information on alternative solutions to a defined problem.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning • **Continuous Progress Assessment**: Portfolio Development, Performance Events/Exhibitions • **Graphic Organizers**: Compare/Contrast Structures • **Problem Solving**: Brainstorming, Heuristics, Inquiry • **Technology/Tools**: Manipulatives, Computers • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite local disaster preparedness official (e.g., Civil Defense representative, National Guard) to discuss problems encountered during a disaster.
- Visit a local government meeting to observe how problems are addressed.
- Interview the owner of a small business to determine problems experienced in setting up a business.

Core Concept: Problem Solving

Sample Elementary Activities

- Create a questionnaire to identify a problem which exists at school. Record the data on a database and graph the result. Brainstorm solutions and recommend one to your teacher or principal. PE, OE, P
- Write and perform a drama which presents a solution to an "unsolved" mystery from your community history. PE, OE, P
- Read a story and create a list of problems confronted by the characters. Choose one problem and develop a possible solution. OE, P
- Design and build a hot air balloon using tissue paper. Complete a test flight. Describe the problems confronted in the process and explain how solutions were developed. PE, OE, P

Sample Middle School Activities

- Design a container to ship a fragile object (e.g., egg, bottle). Experiment with the design to verify its effectiveness (e.g., drop, toss). PE, OE
- Write a bill which proposes solutions to a resource conservation issue. Prepare a list of supporting arguments and present to your legislator. PE, OE, P
- Propose solutions to the student council for the restroom graffiti problem. PE, OE
- Assess your learning strengths and weaknesses. Find a peer who complements your weaknesses. Develop a plan to monitor improvement. PE, OE, P

Sample High School Activities

- Design, build, and select a site for a doghouse which will most efficiently protect the dog from fluctuations in temperature. PE, OE
- Redesign the existing school program so that it is appropriate for meeting the demands of education reform in Kentucky. Present your recommendations to the school-based council. PE, OE, P
- Identify reasons why a machine (e.g., car, lawn mower, sewing machine) is not working properly. Apply a problem-solving process and repair the machine. Check periodically to ensure that the machine continues to work. PE, P
- Organize a team forum to examine issues which affect the youth of the community. Invite public officials to attend and respond to the issues. Research possible solutions and present your findings to the forum participants. PE, OE, P

Reflections

One of the goals of education is to ensure that students leave school with a repertoire of strategies for solving problems. It is through a combination of skills that students arrive at viable solutions to problems. With skills in analyzing, brainstorming, and evaluating, students are equipped to handle problems of any variety.

Whatever the subject, it is important that students be exposed to an effective problem-solving model. It is even more important that through an interdisciplinary team approach, these discrete models can be discussed, compared, and reconciled for better student understanding and future application.

Sources: Fogarty, Perkins and Barell—The Mindful School: How to Teach for Transfer

Notes

Transformations:

Goal 6

Connect and Integrate Knowledge

A student at Kammerer Middle School in Jefferson County connects learning experiences. **Photo by Rick McComb**

Goal 6: Connect and Integrate Knowledge

Academic Expectation **6.1:** Students connect knowledge and experiences from different subject areas.

Learning Links: News Reporting, Hobbies, Decision Making, Pollution, Government, Nutrition, Advocacy, Patterns, Theater, Marketing, Media, Economics

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Elementary Demonstrators

- Use the knowledge and experiences from one subject area to form an explanation and then extend that explanation by making connections with knowledge and experiences from another subject area
- Illustrate the connections of knowledge and experiences between/among different subject areas
- Examine relevant facts and/or information from different subject areas needed to make a decision
- Recognize facts or information from a subject area to make a decision

Middle School Demonstrators

- Defend a position based on information from a variety of subject areas.
- Determine the relationship among learning strategies, processes, experiences, and/or knowledge across various subject areas
- Analyze facts or information from a variety of subject areas to make a decision
- Explain an event using knowledge and experiences from several subject areas

High School Demonstrators

- Justify a solution or course of action for a complex issue by accessing information from different subject areas.
- Evaluate the consequences of ideas and actions by connecting knowledge and experiences in different subject areas.
- Interpret or analyze different perspectives of an event to determine the influence of different subject areas
- Demonstrate understanding of a complex ideas or event from perspectives of different subject areas

Sample Teaching/Assessment Strategies:

Foundation Strategies: Activating Prior Knowledge • **Continuous Progress Assessment**: Observations, Performance Events/Exhibition; Portfolio Development, Self-Assessment/Reflection • **Community-Based Instruction**: Field Studies, Networking, Service Learning, Shadowing • **Graphic Organizers:** Compare/Contrast Structures, Venn Diagrams, Matrices, Graphic Representations, Mapping, Webbing • **Problem Solving/Process** : Inquiry/Investigation/Experimentation, Creative Problem Solving • **Technology:** Computer Utility, Design, Manipulative • **Whole Language Approach** • **Writing**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

Process

- Attend a local planning meeting to see how issues are viewed through different subject areas.
- Interview a local newspaper reporter about factors that have to be addressed in compiling information gained from multiple sources.
- Partner with citizens having different training/occupations to determine how knowledge and experiences have influences their perspectives on a local issue.

Core Concept:

Sample Elementary Activities

- Investigate an issue of concern at school (e.g., the temperature changes in different classrooms, the condition of playground equipement, the recycling of white paper). Examine how things you have done in the past make a difference about how you think and feel about the issue now. OE, P
- Interview family members or neighbors to study differences in job responsibilities. Find out how classes in school are related to their jobs. PE, OE, P
- Create a product or solution to help a physically challenged person in a specific situation (e.g., how to open a tight lid if you have arthritis in your hands, how to reach things on a high shelf if you are in a wheelchair, how to communicate map directions to blind person). PE, OE
- Create examples of how you might teach someone about magnetism by using art, music, or drama. PE

Sample Middle School Activities

- Research information on a specific environmental problem (e.g., ground water pollution, solid waste disposal, automotive emissions); research the problem from different perspectives (e.g., concerned citizens from different areas of town, government officials, local business owner, school official, children, business persons representing different solutions). Simulate a government council meeting and role-play alternative solutions to the conflict. PE, P
- Create and perform a musical, dramatic, or artistic presentation showing how the study of patterns and systems is important for understanding three different subject areas (e.g., science, mathematics, social studies, physical education, language, vocational studies). PE, P
- Develop criteria for locating a new gasoline station or fast food restaurant in your community. Interview a proprietor, government official, environmentalist, and several neighborhood residents to identify the criteria they would use to make a recommendation. Make a decision for the new location based on your criteria. PE, OE, P
- Design a pamphlet advertising a special school event. Apply knowledge from different subject areas to make the event appealing to a broad audience. PE, P

Sample High School Activities

- Debate the solution to a community issue (e.g., land fill, new health facilities, recreational center, new interstate highway) after analyzing the impacts of the issue (e.g., economic, aesthetic, occupational, environmental). PE, OE, P
- Evaluate the educational impact of House Bill 940 (Kentucky Education Reform Act) on you and your school. OE, P
- Develop a plan describing the process for making a major consumer purchase (e.g., car, home, college education, vacation) using knowledge gained from a variety of classes (e.g., mathematics, communication, technology, science, history, geography, vocational, health). OE, P
- Accept/Reject the pros and cons from various perspectives (e.g., health care worker, doctor, insurance companies, small business owners, corporate employer, politicians) relating to the proposed national health bill mandating universal coverage. OE, P

Reflections

- *"This is science class. Why are you grading our spelling and writing?" "How come I have to know all about measuring if this is art?" Being able to connect information and skills, being able to use the same information in a variety of challenging problems, and being able to applyskills whenever the need arises are fundamental components of life-long learning. Adults know that life is not neatly compartmentalized, and that knowledge crosses over from one area to another. Students making connections between subject areas are beginning along the path of life-long learning.*

Goal 6: Connect and Integrate Knowledge

Academic Expectation

6.2: Students use what they already know to acquire new knowledge, develop new skills, or interpret new experiences

Learning Links: Experimentation / Metaphor / History / Exploration / Space / Games / Technology / Science Fiction / Composition / Invention / Market Studies

Elementary Demonstrators

- Make predictions based on information.
- Explore strategies which promote relationships between prior knowledge and information.
- Identify strategies used to acquire existing knowledge.
- Connect knowledge with past experiences.

Middle School Demonstrators

- Interpret information to infer relationships and apply to new situations.
- Evaluate strategies used to relate new information to prior knowledge and experience.
- Select an appropriate strategy to acquire specific new information.

High School Demonstrators

- Select and implement appropriate strategies to extend knowledge, skills, and experiences.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Collaborative Process: Cooperative Learning, Reciprocal Teaching • **Community-Based Instruction**: Field Studies, Mentoring/Apprenticeship/Co-op, Service Learning, Shadowing • **Continuous Progress Assessment**: Observation, Performance Events/Exhibitions • **Problem Solving**: Inquiry, Creative Problem Solving, Future Problem Solving, Interview/Polls, Research • **Technology/Tools**: Distance Learning, Interactive Video, Manipulatives, Puppets, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a professor from a local college or university to discuss the research base for recent scientific discoveries.
- Invite a local physician or agronomist to discuss strategies used to gain new knowledge about their field.
- Interview a pollster with the local paper to discover how information obtained on surveys is used to interpret events and positions.

Core Concept: Developing New Knowledge

Sample Elementary Activities

- Play a new board game without reading the directions. Use your past knowledge of games to make up rules. Evaluate your rules against the rules with the game. PE, OE
- Interview a wide range of people of different ages about the changes they have seen in communication. Predict future changes. PE, OE
- Draw a picture of an event which occurred at your house. Determine how you decided what to put in the picture. Use the same selection process to develop an outline for a story. Write the story. P

Sample Middle School Activities

- Use the scientific method to investigate the relationship between watching television and performance in school. Make predictions based on findings. PE, P
- Identify the skills necessary to successfully operate your favorite video game. Using that information, design a how-to manual for an unfamiliar video/computer game. PE
- Examine several accounts of pioneer survival in American history. Write a science fiction story about pioneers on the first exploration of Mars. OE, P

Sample High School Activities

- Invest and manipulate a portfolio beginning with $10,000 to achieve the greatest growth over a 3-month period. Track the performance of your investment on a computer spreadsheet. PE, OE, P
- Prepare a new recipe for your family based on personal taste, known chemical properties in the food, and food preparation. PE, OE, P
- Stage a "sleuthing party" in which participants begin with some known information and are given clues throughout the party. Write a reflection which examines and evaluates the process you used to solve the mystery. OE, P

Reflections

If students are to become lifelong learners, they must learn how to learn. They must learn to go from what they know to what they do not know. They must recognize differences in strategies used to acquire new knowledge and skills, and be able to apply those strategies to new situations.

If students can apply the processes of learning, they will be able to take charge of their own learning. Being able to ask probing questions is also important to continuing the process.

A story about a Nobel Prize-winning physicist is an example of an inquiring mind. When a reporter asked him why he had become a scientist, the physicist answered, "As a young child, my mother never asked, 'What did you do in school today?' Instead, she always inquired, 'Did you ask a good question today?'" The physicist explained that this expectation to wonder probably led him into the inquiring world of science.

Goal 6: Connect and Integrate Knowledge

Academic Expectation

6.3: Students expand their understanding of existing knowledge by making connections with new knowledge, skills, and experiences.

Learning Links: Apprenticeship / Market Analysis / Analogies / Synergy / Creativity / Experiments / Hypothesis / Teaching / Strategic Planning / Risktaking / Adventure / Theories / Creative Arts

Elementary Demonstrators

- Describe relationships among objects, ideas, and actions.
- Develop generalizations based on data regarding relationships among objects, ideas, and actions.
- Relate new information to specific knowledge, skills, or experiences.

Middle School Demonstrators

- Analyze the connections between new and existing knowledge in specific situations.
- Discover relationships among existing knowledge and new ideas, objects, and actions.

High School Demonstrators

- Examine and revise existing knowledge, skills, and experiences based upon connections with new knowledge, skills, or experiences.
- Apply new knowledge from multiple sources to expand understanding of existing knowledge.

Demonstrators should be read from bottom to top, but need not be demonstrated sequentially.

Sample Teaching/Assessment Strategies:

Community-Based Instruction: Field Studies, Mentoring/Apprenticeship/Co-op, Networking, Service Learning, Shadowing • **Continuous Progress Assessment**: Portfolio Development • **Graphic Organizers**: Advance Organizers • **Problem Solving**: Case Studies, Future Problem Solving, Oral History, Research, Inquiry, Brainstorming • **Technology Tools**: Manipulatives, Computers, Distance Learning, Telecommunications • **Whole Language Approach** • **Writing Process**

These sample strategies offer ideas and are not meant to limit teacher resourcefulness. More strategies are found in the resource section.

Ideas for Incorporating Community Resources:

- Invite a doctor to discuss the need to keep current with new developments in medicine in order to treat patients.
- Attend town council meetings to examine the ways specific information impacts the interpretations and actions taken on a local issue.
- Ask a detective how new information contributes to solving cases.

Core Concept: Expanding Existing Knowledge

Sample Elementary Activities

- Describe ways in which a city and a jungle are alike. Make a pictorial presentation of your findings. PE, OE, P
- Wear a blindfold around school for a morning. Afterward, write a story which shows what it would be like to be blind in school and draw a map of the building which shows hazards for blind people in school. PE, P
- Find a cartoon in the newspaper which prevents a situation similar to one in which you have been involved. Explain how the cartoon gives you a different perspective on the real situation. OE, P

Sample Middle School Activities

- Determine the buying patterns of your friends or family. Interview the display designer at your favorite store to discuss the reasons for the placement and design of displays. Analyze the buying patterns of the identified group to determine if there is a correlation between the display location and buying practices. PE, P
- Analyze the lyrics from current rap songs to better understand social conditions in the United States. PE, OE
- Study customs from the Middle Ages to better understand contemporary social behaviors. Design a graphic presentation of the connections. OE, P

Sample High School Activities

- Investigate recent developments in biotechnology and predict their applications to the problem of world hunger. OE
- Visit a local shopping mall. Describe in a presentation how a high school is like a shopping mall and make recommendations for improving the effectiveness or atmosphere of the school. PE, P
- Determine how applied science has been a historical force in the development of modern civilization. Present your findings to the class. PE, OE, P

Reflections

Expanding knowledge by making connections between new information and old knowledge is a fundamental part of learning. It is the essence of the research and investigative processes required of students. It provides students with a method for seeing existing knowledge from new perspectives. Progress and innovation in society depend on this skill.

One way to develop this skill is to look at an existing situation or work with a familiar idea from new and different perspectives. Students must become self-directed learners who expand existing knowledge as they develop strategies for learning, use those strategies to learn new information, and expand and revise their current ideas based on the new information.

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Transformations:

Kentucky's Curriculum Framework

Volume II

September 1995

Wilmer S. Cody, Commissioner
Kentucky Department of Education

PS 023311

Kentucky Department of Education
Wilmer S. Cody, Commissioner

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Publishing Information

Revised in 1995 by
Kentucky Department of Education
Frankfort, Kentucky

Graphic Design/Production
The Stone Advisory
Lexington, Kentucky

Photographer
Rick McComb
Kentucky Department of Education

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Printed with state funds

Preface

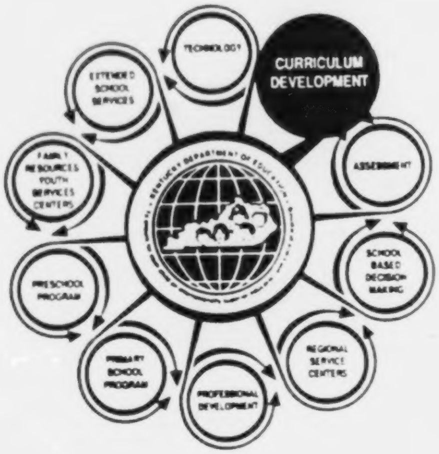
"Each child, every child, in this Commonwealth must be provided with an equal opportunity to have an adequate education."

Supreme Court Opinion
Rose v. Council for Better Education, Inc.

Central to educating all children is the design and implementation of challenging, stimulating learning experiences. These emanate from a curriculum focused on Kentucky's learner goals and academic expectations, instructional approaches which actively engage students, and powerful assessments which identify learning growth and provide direction for future instruction.

KRS 158.6451 (4) directed the Kentucky Department of Education to design a curriculum framework which addresses Kentucky's goals, academic expectations, and assessment strategies and provides "....direction to local districts and schools as they develop their curriculum." *Transformations: Kentucky's Curriculum Framework* addresses that challenge. The two volumes offer further explanation of the academic expectations, suggestions on teaching strategies and activities, and multiple resources to assist with the development of curriculum and instructional units.

While the use of this framework is not mandated, it has been designed to provide guidance and assistance in the development of local curriculum. Designing a curriculum which prepares each student to be successful in life becomes a challenge and responsibility for all of Kentucky's educators, but it is just the first step. The implementation of that curriculum is the critical component in assuring that each child achieves the six learning goals identified in the Kentucky Education Reform Act (KERA).


TECHNOLOGY
CURRICULUM DEVELOPMENT
EXTENDED SCHOOL SERVICES
ASSESSMENT
FAMILY RESOURCES YOUTH SERVICES CENTERS
KENTUCKY DEPARTMENT OF EDUCATION
SCHOOL BASED DECISION MAKING
PRESCHOOL PROGRAM
REGIONAL SERVICE CENTERS
PRIMARY SCHOOL PROGRAM
PROFESSIONAL DEVELOPMENT

Mission

The mission of the Kentucky Department of Education, as the national catalyst for educational transformation, is to ensure for each child an internationally superior education and a love of learning through visionary leadership, vigorous stewardship, and exemplary services in alliance with schools, school districts, and other partners.

Philosophy

These beliefs were used as guiding thoughts in the development of the curriculum framework.

WE BELIEVE

All children can learn at high levels, and they

...possess a curiosity and desire to learn.
...respond positively to success and enthusiasm.
...develop and learn at different rates.
...demonstrate learning in different ways.
...learn by being actively involved, by taking risks, and by making connections.

Successful schools are for students, and they

...expect a high level of achievement.
...provide the time and instruction to achieve student success.
...provide connections with home and community experiences.
...ensure a safe, positive environment.
...create opportunities to explore and grow.

Effective instruction facilitates learning, and it

...addresses identified academic expectations.
...assures success and risk taking.
...employs a variety of effective techniques to address learning diversity.
...aligns curriculum, instruction, and assessment.
...connects curricular offerings to the life experiences of students.
...encourages self-direction and life-long learning.

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Acknowledgments

The following people have given time and energy toward the development of this curriculum framework. Without their contributions, this document could not have been written. Listed are their work assignments at the time of their participation in the framework development.

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Volume II
Introduction

Transformations: Kentucky's Curriculum Framework, Volumes I and II, provide direction to teachers, counselors, media/library specialists, administrators, students, parents, and community representatives as they develop curriculum. The two volumes of the framework should be used together to design student-centered curriculum, instruction, and assessment.

In Volume I, the learning goals and academic expectations have been expanded to indicate student expectations at various levels. Volume II centers on the processes which local districts, schools, and/or school councils may use to develop curriculum, instruction, and assessment that meet their unique needs. The following text addresses each section of the second volume.

Transforming the Learning Environment

Developing curriculum, instruction, and assessment that allow all students to learn at high levels requires a philosophical change from traditional approaches to education. This section presents ways in which the learning environment might be changed to foster sustained learning for all students. It addresses standards-based education, making connections across disciplines, alternative ways of learning, curriculum and assessment connections, technology, and multicultural education.

While Transforming the Learning Environment serves as a guide to curriculum writers, it will be especially useful to teachers as they consider which instructional and assessment practices best facilitate learning for each student.

Alternative Uses of School Time

State and national educational leaders are acknowledging the need to re-examine the organization of school time. Currently, Kentucky statute sets specific requirements about the school year and day; however, if the learning environment is to be changed significantly, educators need to explore creative ways of using school time and facilities. This section of Volume II offers ideas, examples, and models of alternative uses of school time.

Local Curriculum Development Guide

Effective curriculum design is accomplished through a thoughtful process that strongly involves teachers, other district and school personnel, and school councils. The Local Curriculum Development Guide presents one approach to curriculum development.

This section includes examples of a mission statement, philosophy, and action plans; methods for establishing committees/teams, guiding principles, and curricular parameters; and a detailed process for designing an instructional unit. It also addresses professional development, networking, and the process of evaluation.

Bringing It All Together

Bringing It All Together helps to answer the teacher's question, "What do I do-now?" It provides a guide which illustrates how *Transformations: Kentucky's Curriculum Framework* can influence instructional practices.

Jefferson Smith, a fictional character in this section, is a high school teacher who feels the same concerns and frustrations that many Kentucky teachers are encountering as their schools implement educational reform. He works through a number of changes which he believes are needed to enhance the learning experiences of his students.

Resources

The Resources section addresses areas of education that are important to the process of curriculum development. It is made up of five subsections:

- The **Teaching/Assessment Strategies** subsection explains the strategies listed on the demonstrator pages in Volume I. It includes examples and vignettes that illustrate teacher use of specific strategies.

- The **Instructional Material Resources** subsection presents lists of publications, programs, videos, professional associations, and other resources.

- The **Community Resources** subsection provides a framework that districts and schools may use for creating and organizing a database of local, state, and national resources.

- The **Model Teaching Sites** subsection features some Kentucky schools that have implemented changes which reflect one or more aspects of the Kentucky Education reform Act (KERA). Districts, schools, and teachers may choose to contact and/or visit the model sites.

- The **Key Readings** subsection categorizes lists of publications which represent current research and thinking on educational issues. The information from many of these sources was used in the development of the framework.

Just as KERA addresses multiple aspects of education, this framework is a multi-faceted document. There is much educational research which affects change in the classroom that could not be detailed in the framework. Curriculum and instruction designers are encouraged to support their curriculum efforts through continuous research and study. Educational transformation is an evolving process which requires ongoing review and evaluation to sustain change.

"Traveler, there is no path, the path is made by walking it." **Antonio Machado**

Transformations:

Transforming the Learning Environment

Transforming The Learning Environment

What Is Transformation?

Equipped with a computer and the right software, a child today can do what sculptors and poets have tried to do for thousands of years: transform one image into another. The computer catalogue promises that you soon can be "creating dazzling images and transitions, see last year's car model turning into this year's, or a futuristic cyborg villain disguising itself as a valiant heroine." With carefully chosen tools the sculptor may hope to transform raw wood or stone into works of radiant majesty and beauty. The poet tries to choose and combine letters and words in such a way that paper takes on an identity and character of its own. No matter what the process, the goal of transformation has always been the same, to markedly change the form, appearance, nature, function, or condition of an object or an institution.

The form, basic matter, and shape of education have remained the same for nearly a century. With the advent of the assembly line and the need for dependable employees, a system was designed to train students to become workers equipped with minimum skills of literacy and computation, who were able to function on an assembly line for a specified period of time with a minimum of problems. The system worked very well. As a training ground for future employment, students were given work to do, expected to finish it within the limits of the clock, and assessed on the amount and quality they produced. There was no need to insist that all students learn to develop the capacity to think, create, solve problems, or connect their learning across a wide spectrum of knowledge.

The challenges of our rapidly changing society have surpassed the capacities of our schools to adequately prepare all children for the future. Business is telling us that **all students must be able to think and solve problems at the level originally required of a few**. In the past we assumed that all students were not capable of achieving those high expectations. Today the expectations and the assumptions have changed, and we are faced with the need for the most challenging transformation in the history of the Commonwealth. Our concern for all students must be refocused; it must go to the root of the problem. We are required to rethink some of our most fundamental ideas about students, education, school, and learning. In short, what is required is a complete transformation of the learning environment.

Because of legislative mandates to restructure the entire education process, educators and students of Kentucky are uniquely poised to begin this transformation. At times we will feel like true masters of the transformation process, and some small changes will seem to produce tremendous results. At other times the transformation will seem unbelievably slow and cumbersome; we will question the "software" package we have been handed for it will seem tedious and confusing. We will feel like victims of the process rather than initiators. Above all, we must keep focused on the vision of what Kentucky students should know, do, and be like when they complete their public education. Those goals and academic expectations, defined after careful and extensive discussion with citizens around the state, represent a new vision of what we expect and what the future demands.

The Time for Change

It is not enough to adopt lofty ideals and post them in our school hallways. If we shut the door and return to the classrooms we have known, nothing will change. The doors to real change, to true success by all students, must remain open as real transformation begins. Before the process begins, there must be an acceptance of the need for a change.

The Carnegie Forum on Education and the Economy offered one rationale for change when it noted:

> *Much of the rhetoric of the recent education reform movement has been couched in the language of decline, suggesting that standards have slipped, that the education system has grown lax and needs to return to some earlier performance standard to succeed. Our view is very different. We do not believe the educational system needs repairing; we believe it must be rebuilt to match the drastic change needed in our economy if we are to prepare our children for productive lives in the 21st century.*

Many educators realize a need for change grounded in the demands of the 21st century, demands which a system designed for the 19th and 20th centuries cannot meet. Others see a need for change as they look at the vast number of students who have been failed by the present system. They realize that society cannot bear the expense or the social pressures caused by disenfranchising large segments of a developing, restless, and demanding underclass. Another group is inspired to change by the possibilities of a future which is vastly different from the present, a future which is marked by advances in virtually every field of human endeavor. There may be different motives behind the change, but the need is overwhelming; now is the time for change.

The Vision

Transformation of the learning environment is one of the most exciting and challenging revolutions of our time. It involves a philosophical change in the traditional perception of what a school is or should be. It means identifying where we are, determining where we want to be, and devising a plan to effect the change. **The heart of transformation is accepting that all students can learn at high levels–higher than has ever been expected of most students.** This vision represents a radical departure from the way we have normally thought about students. We cannot transform schools if we continue with a view of high achievement for a select group of students, moderate achievement for the majority, and low achievement as an acceptable alternative for others. The statewide commitment to the belief that all students can learn at high levels and the commitment to a standards-based approach to education set the stage for the implementation of the tools necessary for attainment of this belief. These tools include alternative ways of enabling learning, curriculum/assessment connections, and making learning connections.

To realize the vision expressed in the Kentucky Education Reform Act (KERA), Kentucky's perception of classrooms and schools must be transformed from a concept centering on bricks and mortar to an idea of varying learning environments. Education must be seen as a time of limitless possibilities and school as a place designed and structured to meet the specific needs of the students, an environment where time is used creatively.

Transformation as a Process

Just as it takes several steps to change a mouse into a lion in a computer "morphing" program, so it will take many steps to transform our schools into something which conforms to our vision of the future. There are no "cookbook" solutions available, no magic formulae to pull from a shelf. Instead the transformation of our education system must be seen as a process, not an event. It will take a different form in every school as councils, students, teachers, and administrators assess, suggest, attempt, and reassess. Certain assumptions, goals, and commitments will help form the transformation, and these must remain clear throughout the process.

Just as students cannot depend on a textbook for everything they need to know or turn to a workbook for a set of patterned drills, so, too, teachers and administrators must begin to understand that no single format will be appropriate to every student in every situation. A transformed learning environment cannot be attained by simply obtaining a set of procedures or self-directed exercises. Teachers and administrators must assess the needs of their students, design programs, and implement strategies which will be right for their school and their students.

The **What** a child learns must be challenging and rigorous. To accomplish this, the **How**, the **Where**, and the **When** may vary from student-to-student, class-to-class, and school-to-school. The challenge of KERA is to create the proper mix for all students in Kentucky. Student needs are varied, and schools must begin to provide alternative learning opportunities while assisting students to make connections. To facilitate and direct learning, the focus will be on significant, demonstration-driven standards which replace the current emphasis on inputs, accumulated time, and isolated bits of information.

Kentucky's Goals for Education

During the development of the Kentucky Education Reform Act, citizens, educators, and other contributors identified and framed *six major goals for schools*. Districts and schools are not limited to the goals identified by the state; however, it is these goals which are assessed and provide the basis for school accountability.

The first goal issues the challenge:

Goal A: Schools shall expect a high level of achievement of all students.

To accomplish this goal, attitudes must change. Strategies for instruction and assessment must be expanded to include methods which will enable students to experience success at high levels. In this manner students are encouraged, self-actualized, and poised for continued success.

While the composite effect of all the goals provides for the complete reform of Kentucky's education system, it is Goal B which clearly defines the learning goals for Kentucky students.

Goal B: Schools shall develop their student's ability to

1. use basic communication and mathematics skills for purposes and situations they will encounter throughout their lives;
2. apply core concepts and principles from mathematics, the sciences, the arts, the humanities, social studies, and practical living and vocational studies to situations they will encounter throughout their lives;

3. become a self-sufficient individual;
4. become responsible members of a family, work group, or community including demonstrating effectiveness in community service;
5. think and solve problems in school situations and in a variety of situations they will encounter in life, and;
6. connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources.

These six learning goals are further defined by the academic expectations. While the learning goals may be broadly understood as exit standards in KERA's results-oriented education system, the academic expectations are more specific, enabling statements which facilitate the achievement of the six goals.

Non-cognitive expectations for schools are summarized in the remaining four goals:

Goal C: Schools shall increase their students' rate of school attendance.

Goal D: Schools shall reduce their students' dropout and retention rates.

Goal E: Schools shall reduce their physical and mental health barriers to learning.

Goal F: Schools shall be measured on the proportion of students who make a successful transition to work, post-secondary education, and the military.

Standards-Based Education

Standards-Based Education is a learner-centered, success-oriented philosophy which addresses the systemic restructuring of schools. It starts with a clear articulation of what we want students to 1) know, 2) be able to do after they leave school.

It is critical that educators focus on

- **learning that really matters** - related to meaningful understanding and expressions of concepts, higher-order thinking skills, and capacities that are required in our modern information-based society;
- **contexts that are authentic** - related to students' present life experiences and similar to what they will encounter in their future;
- **demonstrations that engage students in role performances** - related to situations which are engaging, open-ended, and realistic.

KERA recognizes not only the importance of designing a program that supports learning, it also emphasizes that "public education involves shared responsibilities. State government, local communities, parents, students, and school employees must be committed to create an efficient public school system... The cooperation of all involved is necessary to assure that desired expectations are achieved."

"To achieve learning that is more meaningful, the learning environment must first be altered to one that will provide real-life learning experiences for students."

Marty Cassady, Student
Edmonson County High School

The support structures of KERA foster an educational program designed to meet the needs of every learner through a commitment to

KERA COMMITMENTS

Standards of performance that all students are expected to attain.

This is a criterion-based system, not norm-based. All students can learn successfully. Exit criteria are the same for all; it is the inputs which will vary per student, not the standards.

Six Learner Goals
Academic Expectations
KIRIS Assessment
Non-Cognitive Indicators

Success of every student.

The emphasis is not on students' learning within a fixed time frame, but on a program of continuous improvement through expanded opportunities.

Extended School Services
Preschool Program
Primary School Program
Technology
Family Resource/Youth Service Centers
School-Based Councils

School change for student success.

School faculties have the responsibility to change systems and practices to promote success by setting priorities and aligning all aspects of school efforts to help students attain the academic expectations.

School-Based Councils
Preschool Program
Primary School Program
Technology
Professional Development
Extended School Services
Curriculum Framework
Continuous Assessment

Sharing the responsibility for learning.

Parents, community, organizations, businesses, universities, and political agencies are stakeholders in education and must develop working partnerships.

Regional Service Centers
Family Resource/Youth Service Centers
School-Based Councils
School Boards
SEEK Funding Formula

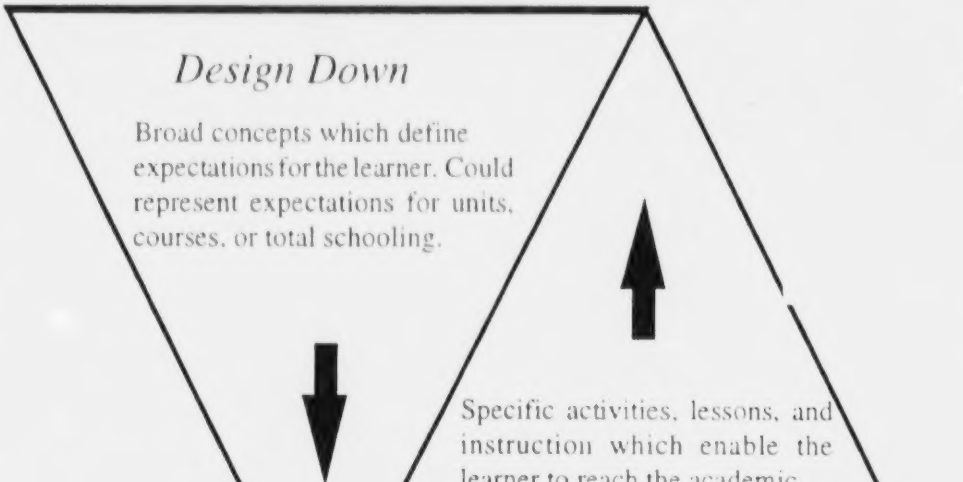
Design Down/Deliver Up

Standards-based education and its manifestations in KERA focus attention on demonstrating learning through predetermined criteria -- the academic expectations. Curriculum development begins with the six learning goals which are the vision of what a Kentucky graduate must know, do, and be like. When we focus on this vision to develop and organize all curriculum design and instructional planning, the process is called *designing down.* Developmentally appropriate contents, processes, and behaviors fully support the desired vision -- students who are successful after they leave school. Basing curriculum on actual student demonstrations of significance, evidence that learners have achieved the goals, will ensure alignment of curriculum and assessment.

The implementation of the process is known as *delivering up.* No single method of instruction, no single kind of classroom activity, no predetermined time period can ensure development of the skills, abilities, and behaviors required for each student. Therefore, it is critically important that varied, flexible, and purposeful instructional activities be used by teachers until all students successfully demonstrate the standards of significance.

As the accompanying table illustrates, there must be a shifting from present practices to a different paradigm of instructional design and delivery.

THE ACADEMIC EXPECTATIONS



Broad concepts which define expectations for the learner. Could represent expectations for units, courses, or total schooling.

Specific activities, lessons, and instruction which enable the learner to reach the academic expectations.

STANDARDS-BASED EDUCATION

Traditional	Standards-Based
Calendar Driven Instruction School entrance, age grouping, student evaluation, number of instructional days and hours as well as school vacations have been based on a one hundred year old agrarian calendar.	***Standards Driven Instruction*** The determinant of student success is no longer the calendar nor the clock but the learners' ability to demonstrate the standards.
Constrained Opportunities The learning has been constrained by limited instructional strategies, structured physical environments, expectations, and time as it relates to schedules, unit development, length of day, etc.	***Expanded Opportunities*** The student's learning time and curriculum needs determine the teaching time. The learning environment becomes more than the isolated classroom and school. It involves the total community. Expectations no longer have a ceiling.
Cumulative Achievement Evaluation has been an average and re-average of learner's work on discrete skills throughout a predetermined time frame. It described a measure of interim achievement.	***Culminating Achievement*** Culminating achievement demonstrates what a learner can do at the end of his/her learning cycle.
Competitive Learning The competitive learning environment had become an individual effort where learners were pitted against each other. Frequently competition and challenge were confused by teachers and students.	***Cooperative Learning*** The learning environment becomes a cooperative effort as learners initiate, implement, and evaluate their own learning. Challenge becomes self-directed and intrinsic.
Comparative Evaluation Comparative evaluation had set expectations of students in terms of those who can and those who cannot achieve. This was exemplified through the bell curve where mediocre quality was acceptable.	***Criterion Evaluation*** Criterion evaluation is set on standards of quality rather than on present random distributions.
Curriculum Coverage "Covering the curriculum" has meant exact knowledge dissemination within a predetermined time frame with less emphasis on student understanding and needs.	***Instructional Coaching*** Instructional coaching involves finding and utilizing instructional tools and methodologies that enable the learner to demonstrate a standard. Appropriate time is allowed for the learning needs.
Segmented Content Disciplines, courses, units, and lessons were chopped into discrete skills and time frames that showed little if any connections.	***Connected Content*** Integration dissolves the lines within and between the disciplines, which in turn creates connected courses, units, and lessons.
Curriculum Design Textbook designed scope and sequence of specific content resulted in fragmented and isolated curriculum. Teachers focused on curriculum coverage.	***Design Down*** Teachers design down from culminating performances to put in place the classroom activities, etc. on which they depend. Teachers focus on the what students should know, do, and be like.

Adapted from "Organizing for Results: the Basis of Authentic Restructuring Reform" by William G. Spady, *Educational Leadership*, October 1988: 4-8.

Tools to Transform the Classroom

While a standards-based foundation forms the heart of Kentucky's education reform, a truly transformed learning environment will occur when other complementary elements are implemented. These elements work to facilitate the transformation. Each requires further study, discussion, and adaptation by local educators as they make implementation of each element more effective and each student more successful.

Alternative Ways of Learning

"The mind, stretched by a new idea, never goes back to its original dimension." **Oliver Wendell Holmes**

We have often seen students in the classroom who seemed capable of learning but who just did not seem to "fit." Sometimes we encounter a student who can fix any piece of audio-visual equipment but just cannot quite make it in a science or mathematics class. We also see students who love to talk, who know everything about everyone, who are wise enough not to tell it all; but that same student cannot seem to put ideas down on paper for a social studies or foreign language class.

Educational research in the past decade has seen an expanded view of concepts such as intelligence, learning styles, and thinking patterns. The research has challenged us to reconsider the student who does not fit the mold and to examine alternative ways of teaching and learning so that all students achieve success in school. Expanded opportunities must be extended to **all** students to help them succeed at the high levels we expect. This shift in commitment will take careful examination and implementation of available options for teaching and learning, and it will challenge many of our basic notions about students, school, the school day, and the school year. It will demand a shift in our decisions about what should be taught, when, and by whom. It will also require that we change many of the ways we have traditionally determined student success and how we record that success.

For years, instruction and assessment have emphasized reading, writing, and mathematics. Stated another way, linguistic and logical/mathematical approaches dominated our view of learning and made grouping children for specific programs, such as exceptional and gifted education, quite easy to promote and defend. In some schools children have been permanently "tracked" or separated into "fast" and "slow" classes, resulting in two curricula: a rigorous curriculum created for those labeled as "fast" and a less rigorous one for those labeled "slow." We even managed to divide and subdivide those categories, ending up with a multi-tiered system.

No other element in the status quo was probably more accepted than this system of ability grouping. The result has been that some students have received an excellent education in our schools while others have been involved in a less demanding learning experience. If we truly believe that all children can learn at high levels, we must also conclude that *success with all children will not change unless our practices change significantly*. Each person learns in a different way and at a different rate. Knowing a student's learning style and needs shifts the instructional approach and the demonstrations of learning. The roles of teachers and students move from teacher-centered to student-centered in everything from curriculum to scheduling.

Flexible Instructional Grouping is an alternative to the traditional tracking of students. It provides opportunities for teachers to group students for any intended purpose. Students can be matched with a group which has a variety of abilities, and memberships in the groups can be changed frequently for task grouping, random grouping, or any other pattern which the teacher or the class chooses. This method avoids ability labeling, encourages collaborative learning, and stresses the benefits of diversity and multiple ways of learning.

Multiple Intelligences is a theory of intelligence which proposes that individuals from all cultures possess at least seven domains of intelligence. For many years, schools have primarily addressed linguistic and logical/mathematical intelligences, but new insights suggest that instruction and assessment would potentially reach more students if a variety of intelligences were addressed. These intelligences, as described by Howard Gardner, include:

- linguistic - the capacity for language;
- logical mathematical - the capacity for classification and abstract reasoning;
- musical - the capacity to discern pitch, rhythm, and timing;
- bodily kinesthetic - the capacity to use the body to accomplish complex activities;
- interpersonal - the capacity for comprehending aspects of character in other people;
- intrapersonal - the capacity to assess personal strengths and motivations; and
- spatial - the capacity to visualize from different perspectives.

One way to assure that every child will receive instruction in all the intelligences is not only to incorporate them into the design of the learning opportunities, but also to permit students to demonstrate achievement of the academic expectations and goals through any of the intelligences. We cannot afford to lose talented students whose abilities lie outside of accepted school patterns. We know how to open up new avenues for success -- begin the transformation of the learning environment, using opportunities for the expression of multiple intelligences as one of the tools.

Student-Directed Learning is characterized by students taking responsibility for setting the direction of their learning and helping determine the types of instruction which are most appropriate for the selected task. It is dependent upon the establishment of an atmosphere of trust and collaboration between teachers and students. It demands student involvement which may range in duration from a class period to an entire term, often depending upon the teacher's comfort level and the student's ability to take responsibility. There are a variety of ways to involve students in the determination of the focus, content, and approach to learning. The Foxfire approach is a well-known model incorporating this type of learning and is currently being used in some schools in Kentucky.

> *"This is a lot better than when we were just in plain old classes. Everybody can learn a lot more and get a better education and be smarter and everything and help other people that have fallen behind and you'll just get very, very smart."*
>
> **Tyler Fields, Student**
> **Hannah McClure Elementary**

Learning Styles and the importance of teaching to the students' sensory strengths have been recognized for many years. The identification of preferred learning modalities -- auditory, visual, and kinesthetic -- provides teachers with additional insights into ways to design learning experiences. Using strategies which encompass different learning modalities assists teachers in personalizing instruction for all students.

Extensive study in learning styles will reveal other areas which impact student learning such as time of day, light intensity, and interaction needs. These variables should be addressed to accommodate differing learner needs.

Curriculum and Assessment Connection

"We must move assessment activities closer to the actual work of teachers and children... assessment should empower students as learners."

Vito Perrone, Director of Teacher Education and
Chair of Teaching Curriculum and Learning Environments, Harvard

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Why assess? Historically, "assessment" of students has ranged from "blue-book" essay exams to standardized tests with "bubbles" which can be scanned and graded quickly. Appropriately or not, scores have been used for promoting or retaining students, giving end-of-course grades, evaluating teachers, tracking students, and comparing states. Test results have often been used for other purposes besides those for which they were designed. Therefore, we must ask ourselves: What is the purpose of student assessment? How do we assess students to accomplish that purpose?

Assessment has historically driven the curriculum. Particularly in the last few decades, standardized testing has been used to influence institutional goals, teacher performance, and program funding. This reliance on standardized assessment has been a major focus driving curriculum in our schools and dominating instruction in the classroom. If assessment has this kind of power, imagine what a changed form can do to influence teaching and learning in the classroom. If our purpose is to improve teaching and learning, assessment must be used to complement and measure what we really want students to learn and be able to do. We must closely align expectations for curriculum and assessment.

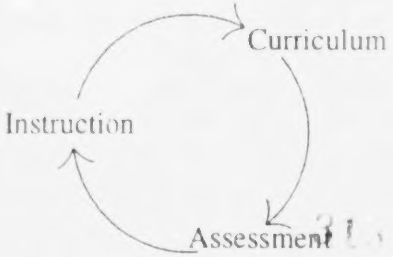
What does it mean to "align" curriculum and assessment?

Consider the following scenario:

> *Mrs. Peterson wants to involve her students in a real-world task which meets several KERA academic expectations under Learning Goal 2 (Core Concepts), Goal 4 (Responsible Group Membership), and Goal 5 (Problem Solving). She wants to include demonstrators under Academic Expectations 2.1: Nature of Scientific Activity and 2.4: Models and Scale such as observing properties, conducting an investigation, and formulating models. Because students had been talking about oil-spill disasters, she designs an investigation related to an oil spill in which students will simulate a spill; work in groups to determine how the oil could be measured, cleaned up, and stored; and present a report to the class. Although her focus will be on the above mentioned goals and academic expectations the task encompasses many other skills and concepts such as measuring, writing, estimating, predicting, evaluating, and visualizing.*

Participation in a problem-solving experience provides a learning opportunity for students and could serve as an assessment task. It is an example of what is called an "instructionally-oriented classroom assessment" or "classroom-embedded assessment."

Rather than assessment driving curriculum, the vision of KERA is that curriculum, instruction, and assessment will be interconnected.



Since meaningful learning is reflective, constructive, and self-regulated, students need to have multiple opportunities to perform and adapt their performance to new situations. They need opportunities to organize, structure, and use information in a context for solving complex problems. From this perspective, assessment becomes not just an event held at the end of the chapter, unit, or year for the sake of assigning a grade, but occurs continuously throughout the learning experience. With the advent of an authentic state assessment, educators are encouraged to develop and incorporate "instructionally-oriented assessments" into locally developed curriculum and individual classroom instruction. The lines between curriculum and assessment will be blurred. The "snapshot" view of student learning provided by traditional testing will be replaced with the dynamic process of authentic assessment which provides a valuable, continuous, and meaningful "documentary" of student learning. Through the assessment/curriculum connection, students and teachers are provided with feedback that allows an adjustment in instructional and learning strategies while students work toward attaining the academic expectations.

"Good teaching is inseparable from good assessing." **Grant Wiggins**

Making Connections

"To the young mind everything is individual, stands by itself. By and by, it finds how to join two things and see in them one nature; then three, then three thousand...discovering roots running underground whereby contrary and remote things cohere and flower out from one stem..." **Emerson**

The ability to make connections across disciplines and to relate new information to prior knowledge and real situations will prepare Kentucky graduates for real-world experiences. This approach to learning is dependent on a thorough understanding of information. **Strong discipline knowledge is necessary to provide the foundation for the connections students will make across disciplines.** However, *different models of instruction must be employed* to allow the development of a rigorous, challenging curriculum that will offer all students the opportunity to make connections among disciplines and to thoroughly comprehend the concepts of the content areas.

Models which provide the basis for integrated learning may be found throughout educational literature. The following examples adapted from the work of Heidi Hayes Jacobs provide a starting point for consideration.

- The discipline-based model enables teachers to address the specific skills, concepts, and knowledge of an identified discipline. Teachers plan and present instruction independently.

- The parallel disciplines model encourages teachers to rearrange the order of topic presentation to align with corresponding information presented by other teachers. Joint planning is required only to identify the time sequence of the presentation.

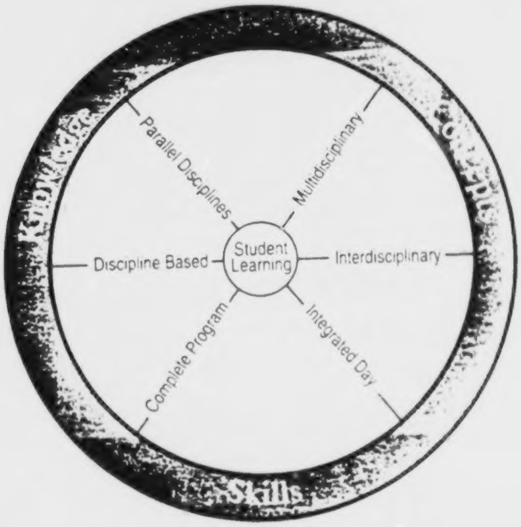
- The multidisciplinary model permits teachers to work together in planning the instruction of related concepts from two or more disciplines. While the teachers jointly identify the topic or theme to be addressed, instruction can still occur in separate classrooms.

- The interdisciplinary model enables a comprehensive integration of the curriculum by bringing together multiple-discipline areas to create units or complete courses. Teachers jointly plan and implement the learning experiences of the students to reflect the interdependence and connections among the various subjects.

- The integrated day model allows for a student-centered approach to learning. This approach can be flexibly utilized by providing students with a range of choices within broadly defined areas of study. It involves a commitment by teachers and administrators to allow students to assist with determining the focus and format of the learning experience.

- The complete program allows the student to become immersed in a topic of study. Students live in the school environment and create the curriculum out of their specific interests. Teachers become true facilitators, and students are empowered by a sense of independent learning. •

No single model for learning will fulfill the needs of every student, every teacher, or every school. Teachers will find it helpful to employ the freedom to move in and out of various models within the course of the school day and year. The possibilities for refinement of models is almost limitless, and student and teacher interests and needs should be leading factors in making the decision about the best model to use.



"You can learn geometry playing baseball. When the ball hits the bat, it reflects a different way."

Leif Aaron, Student
Hannah McClure Elementary

Technology

Few changes in the classroom will be more obvious than those brought about by the advances in technology. Students have grown up in a world of technological sophistication that was virtually unimaginable only a decade or two ago. With the commitment to ensure that every Kentucky student and teacher have access to computers and other technologies, KERA has provided a powerful tool to assist with the transformation process.

One obvious benefit is the enhancement of basic communication as classroom walls and distance barriers become a thing of the past. The use of computers and modems will increase the speed and efficiency with which students can express ideas, explore areas of interest, and transmit thoughts.

The increased availability of technology will expand the resources and opportunities accessible to students, teachers, and administrators. The wise application of these new tools will assist students with the attainment of the learning goals and academic expectations.

Multicultural Education

As we talk about the world getting smaller through the use of technology, a final element in the transformation of the learning environment must be considered. This element takes into consideration the increasing diversity and variety of students found in our classrooms. Although "multicultural education" may mean different things to different people, it must be remembered that sensitivity to other cultures, knowledge of other viewpoints, and accurate assessments of similarities and differences among peoples of the world are vital to preparing students for life in a diversified society.

Multicultural education is interdisciplinary, cross-curricular education which prepares students to live, learn, and work together in a culturally diverse world. Multicultural education should provide equal opportunities for all students and positive results for members of all racial and cultural groups.

Multicultural education is a process, not a product, and must be infused throughout the entire educational structure. It will be reflected in curriculum design, in-school and extracurricular activities, school-based councils, textbook and curricular materials review and selection, and recruitment and retention of minority teachers and staff.

Conclusion

Nothing short of a complete transformation of public education in Kentucky schools will prepare the Commonwealth for the 21st century. The transformation process will not be an instant one nor will it be simple or noncontroversial. Above all, it cannot be superficial or transitory. To return to the words of the Carnegie Forum: *"We do not believe the educational system needs repairing; we believe it must be rebuilt to match the drastic change needed in our economy if we are to prepare our children for productive lives in the 21st century."* We have an overwhelming need for change. The legislature has provided the mandate and the support to see that the change occurs. Education research and collective professional experiences have provided us with new "tools" to enable the reform process. Now the most difficult part begins, the changing of fundamental beliefs about student learning and instructional practices. We must implement a new set of expectations and much higher standards of achievement for all students.

Merely focusing on standards and using a standards-based approach to learning is not enough to bring about a real transformation of the learning environment. Educators must simultaneously change instruction so that students make connections in their learning, are actively engaged, and demonstrate attainment of goals in real settings similar to what they will encounter for the rest of their lives. Classrooms and schools must be altered to prepare students for successful living both in the present and future. It is not enough to be content with adding bits and pieces of reform ideas to a program already in existence. ***Nothing short of a total transformation which begins with the evaluation of the present system, study of new ideas, and implementation of a transformational package designed for local needs will ensure the success of KERA and the success of every Kentucky student.***

Carnegie Forum on Education and the Economy. *A Nation Prepared: Teachers for the 21st Century.* Hyattsville, MD: Carnegie Forum on Education and the Economy, 1986.

Kentucky Department of Education. *Kentucky Education Reform Act.* Frankfort, KY: Department of Education, 1990.

Notes

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Transformations:

Alternative Uses of School Time

Alternative Uses of School Time

A specific charge of the Kentucky Education Reform Act (KERA), KRS 158.6451 (4), is that "The curriculum framework shall identify ... alternative ways of using school time." With such an emphasis, a clear message to districts or schools should be the idea that permission is now given for using school time in new and exciting ways. Partnerships among schools, the community, and local businesses offer opportunities for learning to go beyond the four walls of the traditional classroom; student attendance and credentialing may take on a new appearance as well. This section of *Transformations: Kentucky's Curriculum Framework* presents some guidelines and possibilities for changes in the way school time is used.

Should We Change The Way Our School Day Or School Year Is Organized?

Questions about the focus of the school must be reassessed. Is the time schedule organized around the curricular needs of the students, or are courses, classes, units, and lessons organized around activity or facilities' schedules? Do instructional activities have enough flexibility to accommodate a variety of learning styles and paces, or are the learning needs of students ignored as pre-packaged instructional units are used? Do students have multiple opportunities to demonstrate their learning in a variety of ways, or are the same assessments made of all students in a class at the same time? These questions are difficult to ask and even more difficult to answer.

As schools and districts begin designing curriculum around the expectations of the reform act, changes in the way school time is used are essential. A new curriculum suffers if it is "force-fit" into an existing rigid time schedule. The following questions may help determine if change is necessary:

- How do the current student learning goals and academic expectations compare to the desired student learning goals and academic expectations?
- Which parts of KERA are consistently not being met?
- Are there successful models that may be studied?
- Is a fine tuning or a major overhaul needed?

A teacher's comments:

We knew we were facing some major changes in our school. At the last staff meeting, we really confronted some difficult decisions about where we wanted our school to be by the time the next round of assessments were published. Some of us were ready for change a long time ago, but some are still resisting. One of the first things we had to do was to get past the guilt, anger, and blaming. We acknowledged that good teaching had been around for a long time, but we needed to have the best for all students all the time, not occasionally for just a few. If we were going to really change, we had to do it for the right reasons. The following were the right reasons for us:

- *A school must exist for its students, not for the teachers, parents, or administrators. The curriculum must be written in terms of student expectations, not teacher input or credentialing for seat time.*
- *Scheduling should be determined after curriculum decisions are made.*
- *A main goal of the entire process should be that the students become self-directed learners.*
- *Society makes different demands on its citizens now than in years past. A child's education must reflect those changes. If we expect students to become self-directed, life-long learners, then we must do the same. It would be a lot easier to hire an outside-the-district expert with an established product, but it would not meet the specific needs and resources of our school and community. It is more difficult to do it ourselves, but it will be ours when we finish.*

What Parts Of The System Should We Change?

The education of a student is comprised of many elements, such as curriculum, time schedule, instructional techniques and strategies, student's style of learning, and means of measuring and evaluating students' progress. In making determinations about organizing school time, all aspects of the student's educational experience must be considered. If one element is considered but not the others, no overall change will occur.

For each element in the following chart (**1**) evaluate what is done now; (**2**) identify what you believe for all students; and (**3**) determine what avenues are available to accomplish the goals. Possible responses have been listed based upon the underlying tenets of KERA.

	1. What we do now	*2. What we believe for all students*	*3. What we need to do*
• **Curriculum**	Time-on-task	Performance standards	?
	Teacher-centered	Student-centered	
	Information dissemination	Inquiry-based, experiential	
	Single resource	Multiple resources	
	Elitist	Inclusionary	
• **Schedule**	Restrictive	Supportive	?
	Rigid time segments	Flexible time segments	
• **Instruction**	Single strategy	Varied strategies	?
	Authoritative (Lecture)	Supportive (Coaching)	
• **Learning**	Passive consumption	Active production	?
	Dependent, other-directed	Autonomous, self-directed	
• **Assessment**	Norm-referenced	Criterion-referenced	?

Each of the elements identified above is related to time and how it can be organized to support greater learning opportunities for students. A main focus for both students and teachers is having the flexibility in a day, week, month, or year to explore options.

Who Else Is Involved In The Changes Besides The Students And Teachers?

Anyone who is affected by a change in the structure of the curriculum, schedule, or facilities should be part of the process of change. Because of the possible implications of schedule changes, it is crucial that each group be represented with a real voice in the discussions and proposals. Comments from members of the community reflect their willingness to participate in the change process. Collaborative planning among the faculty, staff, and students about the effective use of time to support learning should prove to be a valuable investment.

An administrator's view:

In the past, changes were in response to an immediate situation that needed "fixing." They represented the "Band-Aid" approach. Adjustments were made to the daily schedule by running the buses in two tiers. We had a video broadcast of a physics class, because we couldn't hire a teacher. This past year we used five days for professional development even though there were complaints that we deprived the students of five days of instruction. Several elementary teachers tried a team approach a few years ago. When construction of the new school was behind schedule, we had to initiate double sessions at the other building. Because these changes were perceived as temporary or stopgap measures, long term implications were not studied. They were put in place just long enough to alleviate a short-term problem until we could return to the regular schedule, or they were isolated attempts at using innovative instructional strategies. Now we know that, because of KERA, there is no more "regular schedule." We are forced to thoroughly examine the entire educational process and redesign our way of thinking.

An early determination of the extent of the changes is also important. Long-range plans may call for an extensive overhaul of the entire system, but short-term plans may be developed to ease the transition. For example, if the upper grades' schedule is redesigned to meet the curricular needs of the students, does the middle school have to change also? Does a change in the middle school have an impact on its feeder elementary schools?

Another aspect of changing school time to meet the students' curricular needs is identifying resources in the community which can extend the learning opportunities beyond the classroom. The following are possibilities:

Sources of Help	Might Provide
Service Organizations	Mentors
	Scholarships
	Project Assistants
Health-Related Agencies	Technical Information
	Stress Management Techniques
	Training
Environmental/Natural Resources	On-site Projects
	Network Connections
Governmental Agencies	Information Distribution
	Legal Implications
Business Personnel	Management Training
	Classroom Collaboration

Comments from the community:

"If we are going to be expected to support a new view of what our school looks like, we want to help shape that look."
Parents

"We have a lot to offer in providing real-life experiences through service learning, mentoring, and apprenticeships."
Community Leaders

As schools, businesses, and other members of communities form true partnerships, students will have many more experiences that are relevant to their lives. Extensive use of technology, field studies, and apprenticeship programs are just three examples of school-related experiences that go beyond the limitations of the building and traditional time structure. Schools implementing service learning may depend on members of the community to schedule students for projects, and schools which have opened facilities, such as the library or media center for community use during the summer, may require the assistance of community volunteers to support the additional staffing needs.

When should the change take place?

Careful consideration should be given to an implementation time line. Moving too quickly raises the level of frustration for all involved; however, moving too slowly may be ineffective. The key is to determine the urgency of the situation. Some changes need to be made quickly, others do not. Time should be allowed for all involved to study, raise awareness, convince others, identify potential barriers, and establish process protocols. Also, a balance should be maintained between studying changes and implementing them.

Models

The following pages offer ten examples of schools that altered the way time is used. The examples consider the degree to which the curriculum is affected and/or the extent of change on other elements of the system. The models are presented as a range of options reflecting reorganization of school time. Only one of the schools is specifically named; other options represent either a single school or a combination of schools where changes were made in using school time to support students' experiences.

Adjusting Other Elements To Students' Curricular Needs

The first two models are situations related to transportation schedules that affect students' academic performances. Both schools are elementary level, but the same dilemmas are faced by middle and high schools. Teachers in these schools were already doing interdisciplinary units, collaborative grouping of students, and hands-on activities; they had identified a need to "find" more instructional time. The second model provides an entire day for professional development, something that had not been previously available.

1. Staggered Instructional Schedule

Original Situation

Students are spending a considerable amount of non-instructional time in school because of a rigid transportation schedule and a limited number of buses. The student population is increasing, but monies are unavailable for purchasing additional buses.

"We were expending a lot of our resources providing care for students who came to school early or stayed late. It seemed like we were wasting valuable time that we could put to better use." - **Principal**

"Coming to school so early and waiting drained students' energy. They weren't performing at the level which we felt they should." - **Teacher**

"I don't have anything to do before school starts. It's kind of hard to study in the hallway." - **Student**

Changed Situation

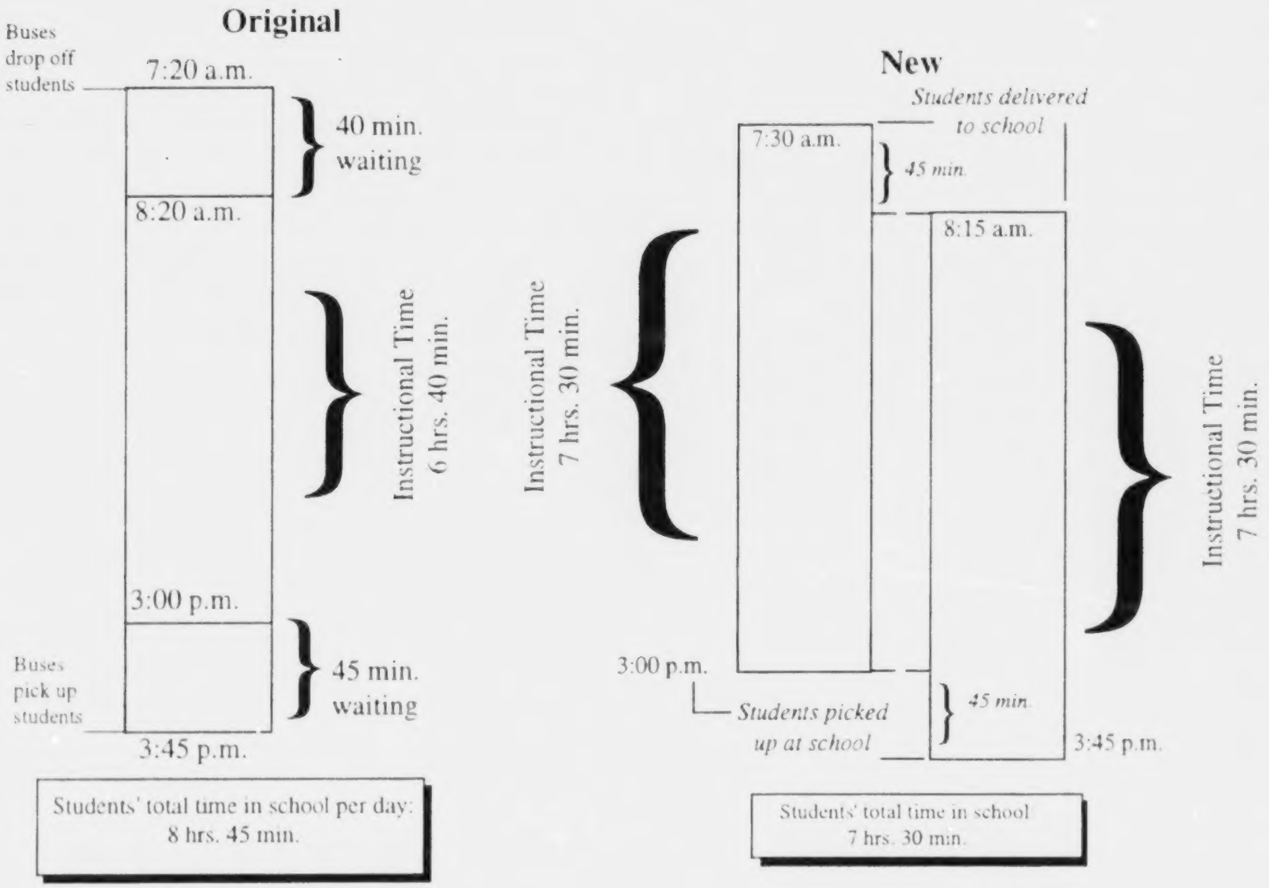
Rearrange the instructional time into two shifts with buses running in two tiers. Students arrive and depart from the school campus at two different times. Teachers helped design and implement the necessary instructional changes as a result of the staggered schedule.

Implementation

By staggering the times when classes begin, the time students are spending on campus is more effectively utilized. Rather than wait at the building for 40 minutes in the morning and 45 minutes in the afternoon, students' transportation time is closer to their class schedules. Teachers are given opportunities to choose between the two schedules.

Benefits

- Increased usable class time
- Flexible opportunities for teachers


Original
Buses drop off students
7:20 a.m.
40 min. waiting
8:20 a.m.
Instructional Time 6 hrs. 40 min.
3:00 p.m.
Buses pick up students
45 min. waiting
3:45 p.m.
Students' total time in school per day: 8 hrs. 45 min.
New
Students delivered to school
7:30 a.m.
45 min.
8:15 a.m.
Instructional Time 7 hrs. 30 min.
Instructional Time 7 hrs. 30 min.
3:00 p.m.
Students picked up at school
45 min.
3:45 p.m.
Students' total time in school 7 hrs. 30 min.

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2. Common Planning Time: 4+1

Original Situation

Instruction is limited to the hours between 8:20 a.m. and 3:00 p.m. even though the bus brings all students an hour before and picks them up an hour after the traditional school day.

"There are too many opportunities for my son to get into trouble while he's waiting for school to start." - **Parent**

"We need more time with our students and with our colleagues." - **Teacher**

"We want to be more responsive to their requests, but we can't change the bus schedule." - **Board Member**

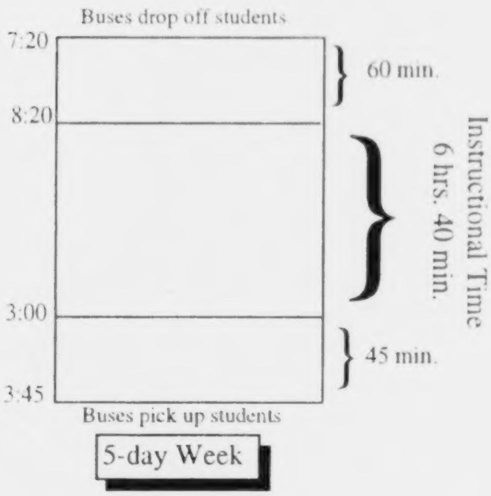
Changed Situation

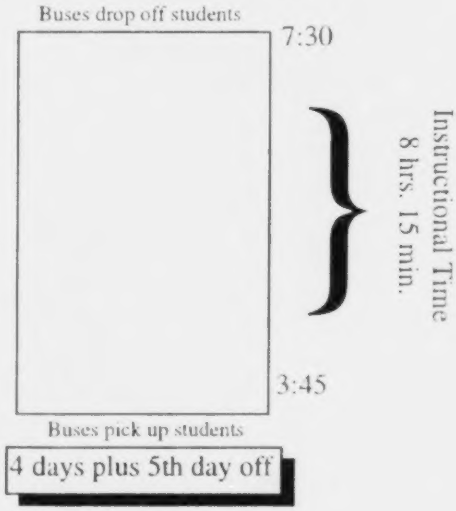
Synchronize instruction with the bus schedule for four (4) days. The accumulated time can be used for such activities as professional development, tutoring, enrichment, and parent conferences on the fifth day.

Implementation

The schedule is rearranged so that classes begin at 7:30 a.m. and end at 3:45 p.m., Monday through Thursday. The staff uses the additional 105 minutes each day for instruction, lengthening each class and developing richer learning experiences for the students. Attendance on Friday is optional for the students; however, volunteers and aides provide activities, additional academic help, and computer instruction for the students who attend. Staff attendance is mandatory, and teachers use the day for planning and professional development.

Original Schedule (7:20 a.m. - 3:45 p.m.)	**New Schedule (7:30 a.m. - 3:45 p.m.)**
Instructional Time 8:20 - 3:00 (5 days)	Instructional Time 7:30 - 3:45 (4 days)
• Class time per day = 6 h 40 m per 5-day week = 33 h 20 m	• Class time per day = 8 h 15 m per 4-day week = 33 h
• After- and before-bus time per day = 1h 45 m per 5-day week = 8 h 45 m	• After- and before-bus time per day = 0
• Total time per day at school = 8 h 25 m	• Supplemental time for students = 8 h 15 m
	• Supplemental time for teachers = 8 h 15 m


Buses drop off students
7:20
8:20
3:00
3:45
60 min.
Instructional Time
6 hrs. 40 min.
45 min.
Buses pick up students
5-day Week


Buses drop off students
7:30
Instructional Time
8 hrs. 15 min.
3:45
Buses pick up students
4 days plus 5th day off

Implementation of this model in Kentucky would require an exemption from the current statute requiring "a minimum of 6 hours per day of actual school work." (KRS 158.060)

Benefits

- Longer periods of time engaged in educational activities
- Additional time for team building
- Collaborative teaching opportunities
- Enrichment opportunities for all students
- Additional support for thematic teaching through related Friday activities
- Real opportunities for staff dialogue, both internally and with the community

Block Scheduling

Time blocks have been devised to allow more flexible daily scheduling or to use a week as the basic unit of school time instead of a day. The examples include (#3) a high school which was incorporating service learning and needed more time for collaborative planning among teachers; (# 4) a schedule showing a block of time completely isolated from the rest of the school schedule but within which three courses were integrated; (# 5) and (# 6), schedules which show fewer but longer class periods in the course of a day with a midday block set aside for guidance or independent study; and (# 7) a model showing the implementation of flexible grouping within a reorganized time schedule.

3. Professional Development/Planning Time Block

Original Situation

Administrators and teachers are locked into the concept of a 5-day week, with each day composed of 6, 55-minute time blocks of instruction with no common time for professional development.

"Why don't we share our successes with each other? I would imagine some really good ideas are in use here...but who has time to listen?" - **Teacher**

"How can I take local businesses and the university up on their generous offers to collaborate, when we don't have the time to sit down and talk with them, much less work in any meaningful way with them?" - **Principal**

"If every minute of every day is managed for me, how am I supposed to be an independent learner?" - ***Student***

Changed Situation

Lengthen each class period and transfer the accumulated time to a half-day block each week for professional development. Students participate in activities such as research and field studies, tutoring, or service learning during that time.

Implementation

Fifteen additional minutes are added to each morning class four days a week. The "collected minutes" are used on Wednesday mornings by students to fulfill community service, finish homework, attend college courses, or tutor, and their participation is recorded and evaluated as part of a program of electives. Teachers use the time on such activities as developing integrated projects, writing grants, or working collaboratively with education specialists from a nearby university.

The Wednesday morning sessions afford teachers time to develop a partnership with a local university providing them with best-practice ideas. After a half-hour general session, all faculty members attend departmental meetings to interpret assessment results, discuss best practices and research, and share videotapes of their attempts to teach new material.

The second half of the morning is spent in mixed-interest groups that discuss successes with cooperative learning, performance events, discipline, student motivation, and time management. Visitors are encouraged to visit the school on this day to listen to the discussions.

Benefits

- Increased amounts of time for teacher communication
- Higher levels of timely and relevant professional development, e.g., teachers learn how to ask better questions, research their work, write articles about their successes, and develop grants
- Increased time for help in the classroom from the university, community, and businesses
- Additional time for students to participate in field studies, service learning, and independent study

Original

	M	T	W	T	F
1					
2					
3					
L	U	N	C	H	
4					
5					
6					

New

	M	T	W	T	F
1					
2					
3					
L	U	N	C	H	
4					
5					
6					

Service Learning/
Professional Development

Implementation of this model in Kentucky would require an exemption from the current statute requiring "a minimum of 6 hours per day of actual school work." (KRS 158.060)

4. Three Courses Integrated in One Time-Block

Original Situation

The rigid scheduling of blocks of time for separate subjects is a hindrance to students making connections among courses such as English, Physics, and Algebra.

"When students finish high school, they should be able to make connections among their responsibilities. Being problem-solvers is crucial in today's society." - **Business owner**

"How do we organize a class to help students make connections among different subjects?" - **Teacher**

"Why is it that everything seems separate when you come to school? The real world isn't like that." - **Student**

Changed Situation

Permit three subjects to be taught within a three-hour block as one interdisciplinary course. It offers one configuration of an opportunity to make connections among these three subjects. A considerable amount of flexibility within that three-hour block is encouraged and supported by the principal.

Implementation

This model is a team-taught class of Algebra II, Physics, and English III. It consists of a group of juniors who are scheduled for a three-class period of time with three teachers. The program lends itself to flextime for each content area, integration of the content areas, and students using community resources without missing time in other classes. High expectations are set, and students are expected to be more responsible for their own learning. The teachers plan on Monday after school, and their instructional week runs from Wednesday through Tuesday. No two days of classes are exactly alike.

The teachers felt that the students needed a better understanding of their personal learning styles in order to make stronger connections, so a two-week study and analysis of students' mindstyles preceded the first projects. Periodically reviewing and updating their information enables the students to apply their understanding of metacognition to their projects and make better use of their own personal time.

While this solution at a specific school is identified for Algebra, Physics, and English, it would be applicable to a variety of course combinations or blocks of time. Typical activities are project-based; utilize thematic instruction; are collaborative; focus on making connections among fields; and include journal writing, video taping, and field work.

Sample of one day's schedule:

	Algebra	**Physics**	**English**
8:30- 9:35 a.m.	Group A		Group B
9:35-10:25 a.m.	Group B		Group A
10:25-11:10 a.m.		All	

When teachers are not directly involved in instruction, they are working with small groups or individual students.

Benefits

- Increased flexibility within multi-hour block to meet curricular needs as students' projects change
- Increased time to develop outreach projects to the community
- Increased time for students to work together on group projects
- Additional opportunities for teachers to implement integrated studies

5. Block Schedule - Credits and Guidance

Original Situation

Traditional credentialing systems assign credits based on the amount of time students spend in a particular course. Daily schedules of five or six class periods repeated over a 180-day year generally reflect those requirements.

"I felt like we were following our old schedule for no other reason than it had always been done that way. It didn't really meet our needs or our students' needs." - **Teacher**

"Students brought so many problems to school that were not related to academics but had an impact on their work." - **Counselor**

"I need more help with my work. It just takes me longer to get it done." - **Student**

Changed Situation

Build blocks of time into the schedule to accommodate the needs of a widely diverse student population in addition to meeting the students' instructional needs. Time is included to assist all who need help developing skills in conflict resolution, understanding and managing their emotions, and socializing postures.

Implementation

Blocks 1, 2, 3, and 4 are academic blocks of 80 minutes each. Students attend classes which meet for one semester during these blocks and schedule new classes for the second semester. This meets the requirements of assigning credits for particular courses.

Two lunch periods and a teacher-assisted guidance period are scheduled during the middle of the day. Year-long classes, such as band and newspaper, are scheduled to meet during the lunch/guidance period.

Benefits

- Fewer preparations for teachers
- Fewer interruptions of the learning process
- Longer periods of class time for deeper investigations into subject material
- More time to address affective needs of students

1 Academic		7:50 a.m. 9:10 a.m.
2 Academic		10:30 a.m.
Lunch	Guidance	
Guidance	Lunch	11:50 a.m.
3 Academic		1:10 p.m.
4 Academic		2:30 p.m.

---

6. Block Schedule - Topics and Membership

Original Situation

A rigid, student-grouping schedule restricts students from participating in a variety of groups for instruction and projects.

"Kids are stimulated by interaction, relevance, and membership. They are expected to learn new skills while there are other demands on their attention. Kids need specific attention and opportunities to learn, relearn, and make connections." - **Teacher**

"We needed a way to facilitate thematic learning that didn't get sloppy when implemented. We also needed to be able to talk to each other about kids' learning. This schedule did both." - **Teacher**

Homeroom & TV News	15 min.
Special Program / Activity Period	30 min.
✻ 1 □ 2 Δ 3 ○ 4	90 min.
✻ 2 □ 3 Δ 4 ○ 1	60 min.
Lunch and Enrichment	90 min.
✻ 3 □ 4 Δ 1 ○ 2	60 min.
✻ 4 □ 1 Δ 2 ○ 3	60 min.
Dismissal	15 min.

✻ □ Represents various
Δ ○ groups of students

1, 2 Represents four
3, 4 different teachers

Changed Situation

Arrange blocks of time around student needs, add flexible groupings, and allow for greater implementation of individualized instruction and curriculum. Groups are determined by student interest in topics and by teacher-assigned membership.

Implementation

Students are assigned to a variety of teams and have various memberships based on the way the faculty has decided to use time and redesign the curriculum for maximum student learning. For example, in the first quarter, a student is assigned membership in a variety of teams. These teams represent different thematic, subject, and project groups that allow the student to interact with others. This provides exposure to different applications for core subjects, and offers ample opportunities to reinforce basic concepts. Teachers' planning periods are arranged so that additional time is available for collaboration as well as individual planning. The chart shows the arrangement of teams and teachers for one day. On another day of the week, the schedule is designed to allow a large-group meeting of students and a common planning time for the teachers.

Benefits

- Additional time for teacher planning
- Continuous teacher dialogue; ability to edit curriculum daily
- Increased time for teachers to follow-up student work
- Increased time for collaborative planning

7. Block Schedule - Independent Student Time

Original Situation

Students move from one class to another every 45 to 55 minutes. This arrangement often limits the time for students to engage in extended discussions, interact with teachers, pursue field studies, tutor, or engage in community exchange projects.

> *"Classes are boring. All we do is sit there and listen to the teachers talk for 40 minutes. The bell rings, and we move to the next room to do it all over again."* - **Student**
>
> *"I know that sometimes the way we control the student learning experience is stifling, but how do we manage new practices, allow kids to become responsible, and still maintain safety and standards to keep up our strong reputation?"* - **Principal**

Changed Situation

Create fewer, but longer, class blocks devoted to teaching and self-directed learning. Flexible time scheduled in the middle of the day gives students opportunities to manage their own time and teachers the opportunity to pay serious attention to their professional development needs.

Implementation

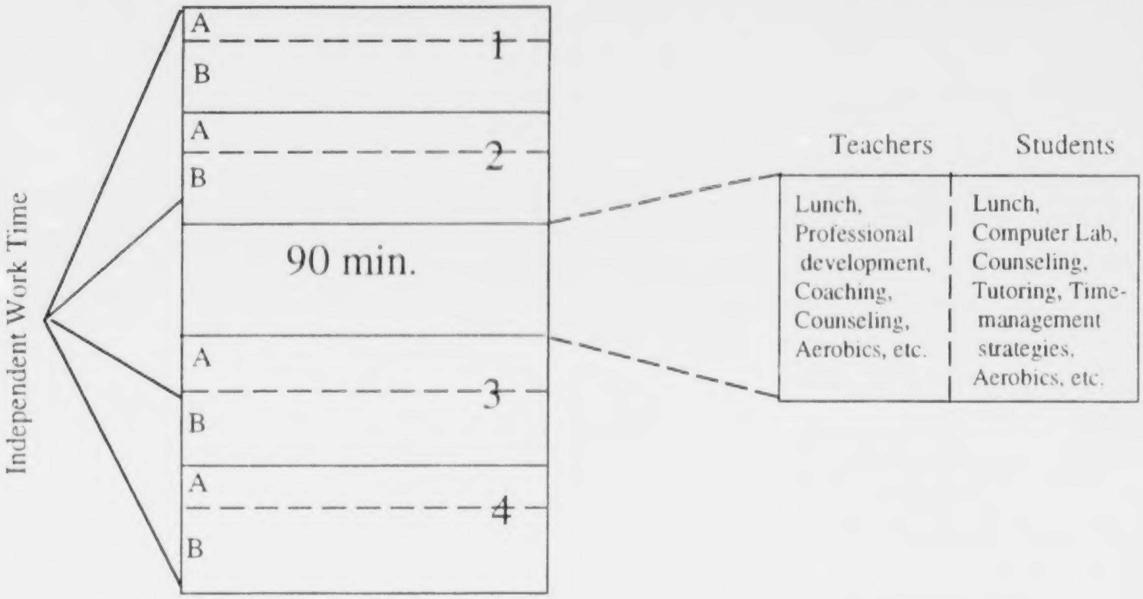
The schedule provides four blocks of 80-minutes each. The time centered on the teacher may be no more than 20 minutes, followed by time for students to do such things as independent research, group activity, or problem solving. As a result, the teacher is now able to facilitate learning, interact with students, or develop alternative lesson plans based on student reaction or interest. Interruptions are discouraged during this time.

A 90-minute block of time in the middle of the day includes lunch and the opportunity for students to learn from a variety of nontraditional offerings such as personal discipline and time management. For some students, options include additional study, tutoring, counseling, parent-approved appointments, and structured athletic activities. Other choices include access to computers, department advisors, and counselors who help with career information, scheduling, and personal guidance.

After lunch, students who need extra academic help are scheduled for appointments with teachers who not only tutor, but also assist students in becoming more independent and successful learners. Teachers rotate their flexible schedule so they have at least two, 90-minute sessions of professional development each week.

Benefits

- Entire school offers more time-related opportunities for the students' best performances
- Improved staff collaboration
- Additional hours of professional development per month (not including an 80-minute planning period every other day)
- More time for better communication among staff, parents, and community and business leaders.


Independent Work Time
A
1
B
A
2
B
90 min.
A
3
B
A
4
B
Teachers
Students
Lunch, Professional development, Coaching, Counseling, Aerobics, etc.
Lunch, Computer Lab, Counseling, Tutoring, Time-management strategies, Aerobics, etc.

1, 2, 3, 4 = 80 min.

A= Approx. 20 minutes of teacher-centered focus
B= Approx. 60 minutes of independent work time

Classical Curriculum and Macroclasses

The next two models have some of the appearances of schools with more traditional class periods or time blocks; however, their approaches to curriculum are quite different. One school (# 8) schedules time to include a program of service learning for students and parent involvement. The other school (# 9) has extended its day to include both an activity/sports block and a nontraditional curriculum.

8. Paideia - A Classical School

Original Situation

Community members, parents, and school officials are faced with general criticisms about curriculum and the use of time to support it. Demands are being made to restructure both the curriculum and the daily schedule in order to raise student performances.

"We're faced with such diversity. How can we offer equity?" - **Principal**

"My kids need to feel a connection to their community." - **Parent**

"It seems like we never have time to do the neat stuff." - **Student**

Changed Situation

Create a rigorous, classical curriculum based on the teachings of Mortimer Adler and focus on models of citizenship in a democratic society. Include concepts such as a strong, single-track curriculum; multiple styles of teaching; and citizenship studies. The basic unit of the schedule becomes the week rather than the day, with classes meeting on a rotating schedule each week. One hundred hours of service learning is required of older students, and time is built into the weekly schedule to accommodate their projects. Helping in the school is part of the parental participation in the curriculum.

Implementation

Besides the courses offered as the general curriculum, Socratic seminars are held for 80 minutes, one day each week and involve the entire school. All students work in groups on the same topic or lesson. Instructional styles include seminars and instructional coaching by all teachers and the principal.

Benefits

- More opportunities for academic equity for students
- Stronger connections between students and community
- Increased parental awareness and support
- Greater personal responsibility for civic issues and decisions among students
- Increased responsiveness to individual student needs

Classes begin at 9:00 a.m.

M	T	W	T	F
1 9:40	7	6	4	2
C & C 10:00	C & C	7 10:25	C & C	3 10:25
2 11:08	1	C & C 10:50	6 Forum	Forum 10:50
3 12:15	4	Seminar	7	4
5 1:35	5	5	5	5
4 2:20	2	1	3	6
6 3:45	3	2	1	7

C & C = Conference and Conversation. C & C leaders are advisors to students in C & C groups. Important information is disseminated and attendance is taken. C & C groups perform community service projects and plan other activities.

Forum = Extended time for C & C groups to discuss current issues and events.

Seminar = Weekly discussions of literature or art. All students participate.

Numbers represent specific classes, held in rotation.

9. Copernican Plan

Original Situation

High school students change location, subjects, and activities seven to nine times each day to provide a broad range of subjects for study. Concerns focus on "covering" a variety of subjects. The unit of time is the day; students repeat a daily schedule with little variation over the course of a year.

"In high school, credit is dispensed in Carnegie units, the product of a 70-year-old system that equates learning with time in class. The curriculum is designed to 'cover' subjects. Those who glean well receive "A's", those who don't, get lower grades, but everyone gets the same number of credits, except for those who absolutely fail." - **Principal**

"We never get to consider complex issues in these classes. It's a joke, sometimes. We cover topics like arms control, environmental pollution, and ethics in 55-minutes blocks each, if at all." - **Student**

Changed Situation

Concentrate on one or two subjects in an extended macroclass. Students are able to spend longer amounts of time deepening their understanding of fewer topics at one time, but still experience the range of subjects over the same span of time. The unit of time is the year rather than the day. By the end of the credentialing period, an equal amount of time has been devoted to each subject. In an alternative credentialing system, more time is available for performance evaluations.

Implementation

The Copernican Plan proposes two possible schedules. In the first schedule, students enroll in only one, four-hour class each day for a period of 30 days. Each student enrolls in six classes each year which fulfills the present requirement of attendance. In the second alternative, the students enroll in two, two-hour classes for 60 days.

Teachers prepare for and teach only one or two classes at a time, three or six times a year. This enables a greater degree of individualized instruction. The average class size is reduced, as a result, by about 20%. Responsive grouping and innovative teaching are used, and lecture time is kept to a minimum. A teacher's daily student load drops more than 60% with more time left for research, class preparation, collaboration, and opportunity to address complex issues.

Flexibility in this plan allows students who wish more prestigious and demanding academic diplomas to earn additional credits. The plan includes five descriptive diplomas - Academic Honors, Academic, Occupational Honors, Standard, and Completion.

<table>
<tr><th>Schedule A</th><th>Schedule B</th></tr>
<tr><td rowspan="3">7:46 a.m.
Macroclass (226 min.) for 30 days</td><td>Macroclass I (110 min.) for 60 days</td></tr>
<tr><td>Passing (6 min.)</td></tr>
<tr><td>Macroclass II (110 min.) for 60 days</td></tr>
<tr><td colspan="2">Passing (6 min.)</td></tr>
<tr><td>First lunch (35 min.)</td><td rowspan="2">Seminar I/Music/ Physical Ed (70 min.)</td></tr>
<tr><td rowspan="2">Seminar II/Music/ Physical Ed (70 min.)</td></tr>
<tr><td>Second lunch (35 min.)</td></tr>
<tr><td colspan="2">Passing (6 min.)</td></tr>
<tr><td colspan="2">Planning/Conferencing/Physical Ed/Music (70 min.)</td></tr>
<tr><td colspan="2">2:45 p.m. Departure (6 min.)</td></tr>
<tr><td colspan="2">Activities/ Sports (135 min.)
5:00 p.m.</td></tr>
</table>

Benefits

- Small-group instruction supported
- Smaller class size
- More time for complex issues
- More time for extended activities
- Less preparation time needed by teachers
- 20% more sections offered with the same number of teachers
- 20% increase in school time devoted to subject material

Year-Round Schooling

The final model compares a traditional calendar of a school year to one which can be implemented year-round. Variations of year-round schooling are becoming more common across the country as more people are influenced by industry and technology rather than agriculture.

10. Year-Round

Original Situation

The agrarian model of three consecutive months of vacation and nine consecutive months of school persists as the single standard for most of public education. Much time is spent in recovery and remediation following a three-month break from school.

"We'd like to deepen our students' experiences with their subjects, but we're limited to 9-week quarters." - **Teacher**

"By the eighth week of summer vacation my son is ready to climb the walls. He's gotten away from using the skills he's learned and will have to relearn them, and tutors are expensive" - **Parent**

"After 21 weeks of school my teachers are crispy they're so burned out." - **Principal**

Changed Situation

Punctuate year-round schooling by three vacation breaks. This schedule would mean less time between instructional periods, more opportunities for students to benefit from consistent contact with teachers, and better use of the school facilities.

Implementation

Chart A shows a traditional school year beginning in September with 36 weeks of instruction followed by 12 consecutive weeks of vacation. Scattered among the instructional time are four additional weeks of vacation centered around holidays. This arrangement was devised to accommodate a large rural population that spent considerable time planting, tending, and harvesting crops.

52 weeks
-12 summer
- 2 winter
- 1 spring
- 1 misc.

36 weeks of instruction

Chart A

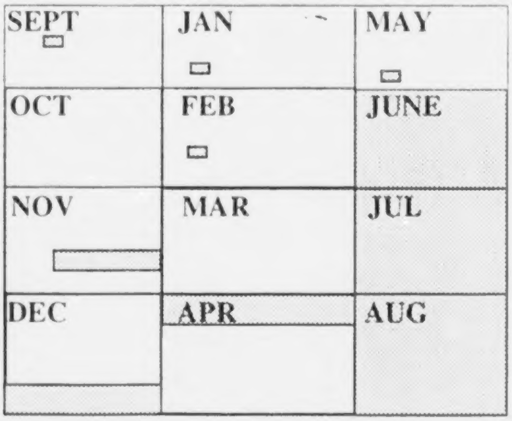
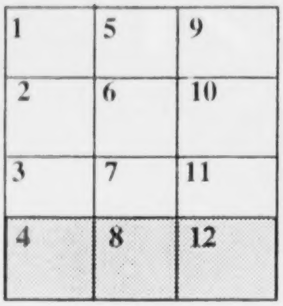


Chart B shows the organization of time for a school year that might begin in January. Each instructional period is 12 weeks long and can be arranged internally to suit the curriculum needs of the specific student population. The total instructional time is 36 weeks with 12 weeks of vacation. The first of three, four-week vacations begins in April, followed by subsequent vacations in August and December. The four remaining weeks of the year can provide additional instructional time or can be flexible vacation time scattered throughout the instructional periods.

Chart B

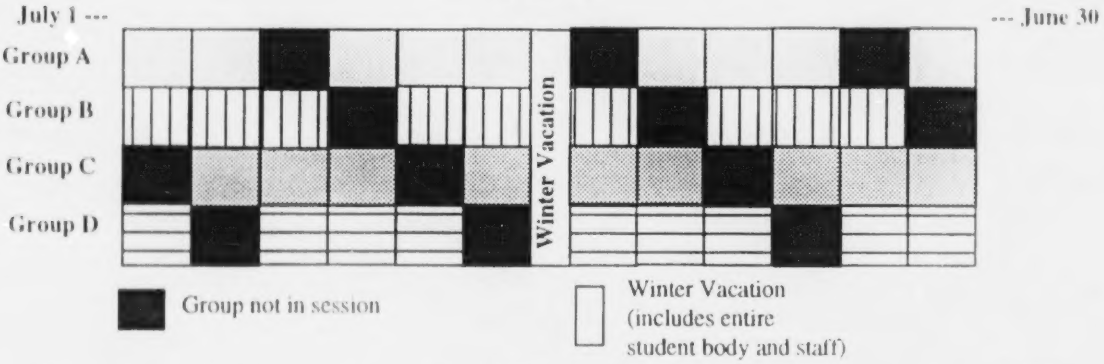


52 weeks
$\underline{-12}$ vacation weeks
40
$\underline{-\ 4}$ weeks flexible
$\boxed{\text{36 weeks of instruction}}$

Each box represents one month.

Chart C represents a school year that could begin in any month and has several groups of students whose curricula are similar. This organization differs from "tracking" in that it more closely resembles the concept of "schools within schools." It is especially appropriate for high schools with a large student population. With four groups within a school, at any one time 25% of the students are not attending school because of the rotating vacation schedule. The basic design resembles that of Chart B. For each group, there are 12 weeks of instruction followed by four weeks of vacation in each of three cycles. The remaining four weeks of vacation may be used for additional instruction or scattered throughout for the observance of holidays.

Chart C



Adapted from "Rethinking the School Calendar" by Charles Ballinger, *Educational Leadership*, February 1988: 59.

Benefits

- Less time spent on remediation for students
- Less need to tutor students during summer vacation
- Less burn-out for both student and teacher
- More extensive use of school facilities for both academic and community purposes
- More opportunities for teachers to attend non-summer conferences and workshops

Summary and Resources

The main reason for considering or implementing changes in daily schedules or yearly calendars is to expand the opportunities for student learning. The curriculum, what the student experiences, is the design for that learning. It should be the focus of the entire education system, and other components should be arranged to support it.

Rearranging instructional time to meet students' needs may involve limited or extensive changes; however, innovative programs have been implemented without any changes in the schedule, and altering the schedule does not guarantee successful learning. Other opportunities, such as distance learning, telecommunications networks, and field studies can extend learning beyond the four walls of the classroom and the daily routine of the class schedule.

There are many options for the organization of time, and each school has unique features that will influence the eventual design. Schools have access to different resources and will encounter different obstacles when implementing adjusted schedules. As schools examine their curricular needs for students to achieve the academic expectations, resources to implement the changes are critical.

The following schools have reorganized time to some degree to be more responsive to student needs. The list is not comprehensive but is intended as a starting point when seeking ideas. The schools are presented as elementary, middle, high school, or those which have a combination of grade levels.

Elementary Schools

Piner Elementary School (Kenton County)
Rt. 1
Morning View, KY 41063

James Spaw, Principal
(606) 356-2155

Mannsville Elementary (Taylor County)
P O Box 178
Mannsville, KY 42758

Norman Feese, Principal
(502) 465-8410

Middle Schools

Calloway County Middle School (Calloway County)
2108A College Farm Road
Murray, KY 42071

Marilyn Willis, Principal
(502) 753-4182

Murray Middle School (Murray Independent District)
801 Main Street
Murray, KY 42071

Pat Seiber, Principal
(502) 753-5125

High Schools

Scott High School (Kenton County)
Old Taylor Mill Road
Covington, KY 41015

Robert Konerman, Principal
(606) 356-3146

Western High School (Jefferson County)
2501 Rockford Lane
Louisville, KY 40216

Lucian Yates, III, Principal
(502) 473-8344

Greenwood High School (Warren County)
5056 Scottsville Road
Bowling Green, KY 42104

Peggy Cowles, Principal
(502) 842-3627

Fulton County High School (Fulton County)
Rt 4
Hickman, KY 42050

Larry Gardner, Principal
(502) 236-3904

Fairdale High School (Jefferson County)
1001 Fairdale Road
Fairdale, KY 40118

Marilyn Hohmann, Principal
(502) 473-8248

Combinations Across Grade Levels

Laboratory School
University of Colorado
2314 45th Avenue
Greeley, CO 80634

Sue Swain, Principal
(303) 351-2321

Chattanooga School for the Arts and Sciences (Paideia)
865 East Third Street
Chattanooga, TN 37403

William Kennedy, Principal
(615) 757-5495

Transformations:

Local Curriculum Development Guide

Local Curriculum Development Guide

Introduction

The real curriculum is the one the student experiences. It is the result of the activities, processes, and arrangements designed to provide learning opportunities to educate the student.

The ultimate goal of the Kentucky Education Reform Act (KERA) is to prepare students to be successful in tomorrow's world. Policies, priorities, and practices must be redirected, redefined, and restructured to create conditions which allow for the success of all students. The learning environment must be transformed through a standards-based design that focuses on student competence. The curriculum must stretch the students' thinking; expand experiences beyond the classroom walls; reflect the use of appropriate instructional materials and strategies; and prepare students to live, learn, and work together to achieve common goals in a culturally diverse world. This transformation can only be achieved through a continual, well-designed curriculum development process that is collegial in nature; reflects the interrelationship of curriculum, instruction, and assessment; and continually realigns curriculum to the academic expectations. The most effective curriculum is developed by local teachers who have a strong knowledge base; an understanding of the developmental stages of student learning; and the ability to combine both into a relevant, stimulating instructional program. And, the most effective curriculum policies are developed by school councils or committees composed of parents, teachers, and administrators who are closest to the curriculum issues of each school.

The designing of curriculum should involve a thoughtful process which encourages questioning, rethinking, and revisiting. This section of the framework offers **one** approach to curriculum development. The guide suggests procedures which local school districts, schools, and school councils can use in designing their curricula, but the process is not intended to be prescriptive nor exclusive.

Commitment

While teachers are central to the curriculum development process, they are not solely responsible. If the instructional program is to be comprehensive and effectively implemented, local district and school personnel, and community members need to fully commit to the curriculum design process.

- **School board members** identify curriculum improvement as a major emphasis for the district. As community representatives, they must be strong advocates of curriculum transformation and publicly support strong, standards-based, instructional programs.

- **Superintendents** provide vision and establish a support system that promotes risk taking. They must believe and communicate to the entire community that the instructional program is the top priority. Additionally, financial and human resources necessary to facilitate the development of quality curriculum must be provided.

- **Curriculum coordinators** at the district or school level provide leadership in planning and coordinating the curriculum effort. Curriculum, instruction, and assessment need to be viewed as the focal point of their responsibilities.

- **Principals** must play a key role in the development process as the instructional leaders in their schools. As advocates for change, they study research-based instructional issues, remain current on educational thought, and encourage active research in their schools. As enablers, they nurture the creative spirit of the teachers and support risk taking. As facilitators, they provide effective professional development opportunities, encourage teachers to be innovators, and allocate time and resources for curriculum development activities.

- **School councils** play the critical role in establishing policy which addresses the development of quality, standards-based curricula and the selection of appropriate resources, including instructional materials and textbooks, used at the school.

- **Teachers** who are progressive thinkers, collaborative workers, and risk takers must be active in redesigning the curriculum around significant academic expectations. Because they can be effective change agents, as well as curriculum writers, they are central to the development process.

- **Parents/community representatives** are invaluable resources as advisors and should be viewed as cooperative partners in the curriculum design process. Their insight into student and community needs complements district personnel as a balanced, focused curriculum is developed.

- **Students** are central in identifying the focal point (major questions and issues) of instruction, assisting with the design of culminating performances, and becoming critically involved in their own learning.

Procedural Overview

The procedural overview presents a basic checklist for the development process which is the combined responsibility of both the school district and school personnel. The procedure for curriculum design as detailed in this section addresses four assumptions: collaboration through committees/teams, change driven by a shared vision, comprehensive planning, and capacity building as a component of success.

I. Collaborative structure creates the conditions under which the process is legitimized and the product is validated.

- ☑ **A**. Establish district curriculum/assessment committee.
- ☑ **B**. Establish parameter development teams.
- ☑ **C**. Establish instructional unit development teams.
- ☑ **D**. Provide group process training to district/school personnel.

II. Fundamental change is driven by a shared vision.

- ☑ **A**. Analyze Kentucky's learning goals and academic expectations and internalize the basic premises.
- ☑ **B**. Develop a mission and philosophy for both the district and school which reflect the basic tenets of KERA.

III. Comprehensive plans lead to success.

- ☑ **A**. Determine basic issues of development responsibilities.
- ☑ **B**. Develop action plan for curriculum development.
- ☑ **C**. Establish guiding principles for instructional program.
- ☑ **D**. Determine curricular parameters of learning.
- ☑ **E**. Design instructional units.

IV. Successful implementation requires capacity building.

- ☑ **A**. Provide comprehensive professional development opportunities for all district/school personnel.
- ☑ **B**. Establish effective networking systems.
- ☑ **C**. Develop and implement an on-going, systematic process for evaluating progress in a results-oriented manner.

This procedural overview can serve as a reference for curriculum designers as they work through the Local Curriculum Development Guide section. Each component will be treated separately on the following pages.

Building A Collaborative Structure ➡ ➡ ➡ ➡ ➡

I. Collaborative structure creates the conditions under which the process is legitimized and the product is validated.

☑ **A.** Establish district curriculum/assessment committee.

☑ **B.** Establish parameter development teams.

☑ **C.** Establish instructional unit development teams.

Creating Conditions for Collaboration

Committee/Team Structure

The structure of **this model is a collaborative design between the district and school** and indicates the support necessary for school improvement through curriculum planning. However, the school is and must remain the central focus for curriculum development. In some districts, the decision may be made for the schools to address the responsibilities designated as both "district" and "school." Where school-based councils exist, the councils may independently develop curriculum policies and curriculum, or they may choose to work cooperatively with central office. Regardless of where the teams are based, success depends upon the degree of understanding and ownership in the process experienced by each member.

Key Attributes

There are certain attributes each district/school will expect the committee/team members to possess which enable them to function effectively and with vision.

- Believe all students to be successful.
- Seek consensus rather than compromise.
- View curriculum development as a continuous process.
- Are knowledgeable of research-based educational issues.
- Possess working knowledge of Kentucky's Learning Goals and Academic Expectations.
- Apply group processing skills.

District Curriculum/Assessment Committee

The District Curriculum/Assessment Committee is a standing committee with a broad representation of teachers as well as administrators and support personnel. The DCAC establishes general guidelines for all aspects of the instructional program.

Guiding Questions
- What do we believe?
- What do we know?
- What do we want?
- What will we do?

Suggested Membership

While each district/school may want to expand the membership of the committees and teams, generally the composition would reflect the following:

- District Curriculum Coordinator
- Teachers
- Parents/Community Representatives
- Principal(s)
- Library/Media Specialists
- Student(s)

Key Responsibility
- Establishes Guidelines

Key Attributes
- Perceive curriculum, supervision, and staff development as interconnected entities necessary to implement the vision.
- Emphasize teacher ownership of curriculum planning.
- Recognize the importance of future needs, challenges, and trends as a dimension of curriculum development.

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Parameter Development Teams

Parameter Development Teams function primarily through the development process. Their major responsibility is to determine district or school parameters which focus the design and delivery of curriculum and instruction.

Guiding Questions

- What do we want students to know and be able to do at appropriate levels?
- How do we reflect national standards?
- How do students demonstrate broad areas of learning?
- What are the available district support systems?

Key Responsibility

- Determines Parameters

Suggested Membership

While each district/school may want to expand the membership of the committees and teams, generally the composition would reflect the following:

- District Curriculum Coordinator
- Teachers
- School Council Representatives
- Library/Media Specialists

Key Attributes

- Perceive curriculum, supervision, and staff development as interconnected entities necessary to implement the vision.
- Emphasize teacher ownership of curriculum planning.
- Recognize the importance of future needs, challenges, and trends as a dimension of curriculum development.

Instructional Unit Development Teams

Instructional Unit Development Teams may or may not be considered standing teams at the school level. The role of the IUDT is to design instructional units within the district or school parameters.

Guiding Questions

- What is the curriculum structure?
- How do we determine the focus of an instructional unit?
- What content, themes, curricular approaches are to be used?
- How does a unit reflect multiple academic expectations?
- How can we involve students in the design?
- How do we align instruction with assessment?
- How do students demonstrate learning?
- How do we organize to complete this task?
- What are the available resources?

Suggested Membership

While each district/school may want to expand the membership of the committees and teams, generally the composition would reflect the following:

- School Council Representatives
- Teachers
- Library/Media Specialists
- Student(s)

Key Responsibility

- Develops Instructional/Assessment units

Key Attributes

- Are knowledgeable of state and national education movements.
- Recognize and value the interrelationship and importance of all disciplines, but specialize in an identified content area.
- Identify essential learning and discriminate between critical and noncritical knowledge.
- Are knowledgeable of developmental needs of students.
- Demonstrate a positive knowledge of various instructional strategies.
- Possess the ability to create and synthesize.

	District Curriculum/ Assessment Committee	Parameter Development Teams	Instructional Unit Development Teams
Committee Responsibilities (These correspond with Procedural Overview)			
Establish and coordinate parameter and instructional unit development teams. (I.B) (1.C)	x		
Provide group process training to district/school personnel. (I.D)	x		
Analyze Kentucky's learning goals and academic expectations and internalize the basic premises. (II.A)	x	x	x
Develop a mission and philosophy which reflect the tenets of KERA. (II.B)	x		
Determine basic issues of development responsibilities. (III.A)	x		
Develop action plan for curriculum development. (III.B)	x		
Establish guiding principles for instructional programs. (III.C)	x		
Establish and communicate the steps, stages, and/or functions of curriculum process (curriculum model).	x		
Address ongoing issues of curriculum development and instruction.		x	
Determine curricular parameters of learning. (III.D)		x	
-Establish the essential results (demonstrators) for students at each level or course.		x	
-Establish skill expectations to be demonstrated at various levels.		x	
-Develop critical knowledge for various levels.		x	
-Determine culminating performance expectations and develop performance assessments at various levels.			x
Design instructional units. (III.E)			x
-Determine the curriculum structure for organizing content.			x
-Establish major focus of unit.			x
-Establish culminating performance and scoring rubric.			x
-Identify critical knowledge and skills students must possess to successfully demonstrate the culminating performance.			x
-Justify all content taught as aligned with district and/or school expectations and parameters.			x
-Develop instructional/assessment activities.			x
-Choose instructional strategies.			x
-Choose curricular materials based upon alignment with student expectations.			x
-Determine reporting and grading practices.			x
-Reevaluate instructional units as part of ongoing reflection and program assessment tool.	x		
Provide professional development opportunities for all district/ school personnel. (IV.A)	x	x	x
Establish effective networking systems. (IV.B)	x	x	x
Develop and implement an ongoing, systematic process for evaluating progress in a results-oriented manner. (IV.C)	x	x	x

I. Collaborative structure creates the conditions under which the process is legitimized and the product is validated.

☑ **D.** Provide group process training to district/school personnel.

Group Process Training

The ability to work efficiently and effectively in groups with diverse members, to delegate and perform assigned tasks, and to resolve potential conflicts is essential to district/school committees and teams if they are to purposefully influence change in the district, school, and classroom.

The expectations in Goal 4 enumerate those skills necessary for becoming a responsible and productive group member; they apply to staff as surely as they apply to students.

- Manifest interpersonal skills.
- Contribute productive team member skills.
- Display consistent, responsive, and caring behavior.
- Recognize the rights and responsibilities of self and others.
- Encourage a multicultural/world view.
- Maintain an open mind to alternative perspectives.

The process for developing effective teams includes the following:

- Determine your vision for the group; and
- Provide training in
  building and maintaining trust,
  sharing information,
  shared risk taking,
  accepting and utilizing individual talents,
  setting team goals,
  maintaining a balance between task and needs,
  problem-solving techniques, and
  shared leadership.

There are a variety of resources available to assist districts and schools as they begin the team building process. Local colleges and universities often have faculty members who provide training in group process skills. Further, many business or management firms have individuals specifically assigned to team development. An investigation of such community resources might reveal others which are available.

Initiating a group process (e.g., high performance, facilitator training, leadership) insures that members of the group come to meetings with good spirits and high energy; feel meetings are productive; and face problems/questions directly, frankly, and openly without harming the group's cohesiveness. Also, the members leave the meetings with the same level of high energy and good spirits. The group process further creates a sense of productivity, time efficiency, group management, and group mission and purpose.

II. Fundamental change is driven by a shared vision.

☑ **A.** Analyze Kentucky's learning goals and academic expectations and internalize the basic premises.

☑ **B.** Develop a mission and philosophy for both the district and school which reflect the basic tenets of KERA.

Establishing a Shared Vision

Once the collaborative structure is in place, the district and school should begin to focus on the shared vision which directs all instructional and learning experiences.

Analyzing Goals and Academic Expectations

The six learning goals and academic expectations are the basis for curriculum and assessment; for this reason, it is crucial that all persons involved in curriculum and assessment design study the implications of the goals and academic expectations on curricular change. **They must internalize the basic premises of KERA and establish them as the foundation for instructional design and delivery.**

Forming study groups is an excellent method for personnel to examine and develop ownership of the goals and academic expectations. This serves as a vehicle for fostering a collaborative spirit as well as a learning opportunity for all participants.

The next steps in establishing a shared vision are the development of mission statements and philosophies at both the district and school levels. Because it is central to the design of learning experiences, it is important that all district and school personnel believe in and commit to the mission statement and philosophy of beliefs.

Mission Statement

Mission: *The mission statement is a clear and concise expression of the district's/school's purpose and function.*

The mission statement reflects the shared vision of a district or school, and it directs all decision-making and resulting actions. According to William E. Deming, an American management theorist, successful organizations identify a purpose and are constant in an effort to achieve that purpose.

This especially holds true for educational institutions which are engaged in preparing students for the future. Because of the multiple actions and interactions existent in the daily operation of a district or school, it is critical to maintain a single focus. This is accomplished through the development of and commitment to a mission statement that reflects the core beliefs of the group.

The mission is developed with input from the district's or school's formal and informal leaders. The members of this group are selected because of their ability to analyze concepts and to interact with and get input from their colleagues. Because it is critical that belief in and commitment to the mission extend beyond the leaders, affording everyone an opportunity for input is essential. The mission provides direction for all employees within the district.

Developing A Mission Statement

STEP 1

Brainstorm →→ • Solicit ideas from all members.
Gather and Analyze Information →→ • Record, discuss, and analyze ideas.
Develop Draft →→ • Develop drafts from the collective thoughts of the group.

↓
↓

STEP 2

Share →→ • Share with all stakeholders.
Encourage Input →→ • Collect comments from all stakeholders.
Revise →→ • Revise first draft.

↓
↓

STEP 3

Finalize →→ • Finalize document.
Submit →→ • Submit to the board of education/school council for adoption.
Disseminate →→ • Disseminate to stakeholders.

The Kentucky Department of Education's mission statement may serve as an example.

The mission of the Kentucky Department of Education, as the national catalyst for educational transformation, is to ensure for each child an internationally superior education and a love of learning through visionary leadership, vigorous stewardship, and exemplary services in alliance with schools, school districts, and other partners.

Philosophy

Philosophy: *The philosophy is a set of principles or beliefs used to guide decision-making.*

Before writing curriculum or addressing instructional issues, it is imperative to identify commonly held beliefs. These serve as the guideposts and qualifiers for all work; thus, they must be internalized. The philosophy logically flows from the mission statement and should be developed by the same group of formal and informal leaders to insure continuity of thought.

Developing a Philosophy

STEP 1

- Brainstorm statements reflecting what each group member believes about education (e.g., "I believe that all students can learn"; "All instruction should relate directly to the academic expectations.")
- Record and post the responses.

STEP 2

- Combine thoughts, qualify statements, and improve wording. The group must agree on the final statements.
- Group the beliefs according to logical organizers (e.g., students, schools, instruction, and teachers).

STEP 3

- Circulate the philosophy among all stakeholders. Just like the mission statement, the philosophy provides the basis for all curricular and instructional decisions within the school or district so it must TRULY represent the beliefs of all involved.
- Obtain input and make necessary revisions.

STEP 4

- Distribute the philosophy.

Philosophy which directed the development of Kentucky's Curriculum Framework

WE BELIEVE

All children can learn at high levels, and they
...possess a curiosity and desire to learn.
...respond positively to success and enthusiasm.
...develop and learn at different rates.
...demonstrate learning in different ways.
...learn by being actively involved, by taking risks, and by making connections.

Successful schools are for students, and they
...expect a high level of achievement.
...provide the time and instruction to achieve student success.
...provide connections with home and community experiences.
...insure a safe, positive environment.
...create opportunities to explore and grow.

Effective instruction facilitiates learning, and it
..addresses identified academic expectations.
...assures success and risk taking.
...employs a variety of effective techniques to address learning diversity.
...aligns curriculum, instruction, and assessment.
...connects curricular offerings to the life experiences of students.
...encourages self-direction and life-long learning.

III. Comprehensive plans lead to success.

- ☑ **A.** Determine basic issues of development responsibilities.
- ☑ **B.** Develop action plan for curriculum development.

Planning for Success

Responsibilities Chart

Before initiating the development process, it would be helpful to discuss the various aspects of the process. Directions, roles, and responsibilities of all stakeholders in the process must be identified and clarified. This chart facilitates the identification of the specific responsibilities for relevant personnel.

	Curriculum Development	Instruction	Assessment
Superintendent			
Curriculum Coordinator			
Principal			
School-Based Council			
Teacher			

Curriculum Development Action Plan

Action Plan: *The action plan is a comprehensive, thoughtful proposal that establishes the procedures and assigns the responsibilities for curriculum development. It must be based on the district's or school's mission statement and philosophy of beliefs.*

Purpose

The action plan will provide guidance to the curriculum coordinator and committees as they develop the district's or school's curriculum. The objectives, strategies, time lines, responsible individuals, and budget must be thoughtfully established to provide reliable direction. Action plans are developed annually and reviewed periodically to ensure continued relevance, effectiveness, and progress toward attainment of objectives.

Preparation

Before starting work on the action plan, answers to these pertinent questions regarding curriculum development should be addressed:

- To what extent will the district be responsible for curriculum development?
- To what extent will the school be responsible for curriculum development?
- Who will coordinate the development efforts?
- How will the development teams be selected?
- Will the curriculum be discipline-based? Interdisciplinary? A combination?

Decisions do not have to be made at this time regarding alignment to academic expectations, themes or organizing questions, instructional/assessment activities, or material resources. Those are all areas which will be addressed during the curriculum development process. However, it is essential to establish a map for accomplishing those tasks. The "when," "why," and "how" must be identified before the "what" can be designed.

Definitions

Budget: The budget is the identification of financial requirements for the completion of the task. It should reflect both personnel and operating expenses on a yearly basis.

Evaluation: The evaluation addresses the determination of successful completion of the objectives.

Individual Responsible: The individual responsible is the person who has ultimate responsibility for assuring that the strategy is completed; however, this individual does not actually complete all the work.

Objectives: Objectives are specific, measurable ends that must be achieved to accomplish a goal.

Strategy: A strategy is a coherent set of activities that assist with effective achievement of the objectives.

Time line: The time line is an identification of the specific time (month, year) when the activity will be initiated and completed.

Developing the Action Plan

The major components of most action plans are objectives, strategies, evaluation, and budget. Objectives and strategies are two of the most critical components, but their similarities of focus require additional clarification. The objective indicates the major, measurable goal and provides a completion date while strategies identify specific means of accomplishing those objectives.

Development of the action plan will be more manageable if it is broken down into two (2) phases.

Phase I

The district or school committee must first determine which curriculum development issues to address in the action plan. Issues such as professional development and curriculum design that directly or indirectly affect curriculum and instruction should be included.

The establishment of valid, workable objectives is the next step in Phase I and is essential to the successful completion of the plan. Answering the following questions will provide assistance with formulating objectives:

- Does it reflect the completion of a specific goal?
- Is it measurable and verifiable?
- Does it include a specific completion date?
- Does it contain a specific action verb?
- Is it straight-forward and clearly understandable by all parties?
- Is it consistent with available or anticipated resources?
- Is it realistic and attainable within the time specified?
- Is it consistent with the mission statement and philosophy?

SAMPLE CURRICULUM DEVELOPMENT ACTION PLAN*
Phase I
Newly School or District
1993-1994

Issues: Professional Development
Curriculum Design
Evaluation Process

Objectives:

1. By April 1994, all district and school personnel will have engaged in professional development activities which affect student performance.
2. By May 1995, the curriculum will have been completed.
3. By May 1995, a systematic, evaluation process will have been designed.

**The action plan is intended for local use and does not have to be approved by the Kentucky Department of Education*

Phase II

Phase II of the Action Plan must detail the strategies, evaluation, and budget components which lead to the achievement of each objective written for the issues identified in Phase I.

Identifying Strategies

It is critical that the strategies are realistic and directly related to a specific objective. Answering the following questions will assist in developing strategies which are the heart of the plan:

- Are all the products and activities necessary to achieve the objective listed?
- Are they easily understood?
- Will the sum of the activities achieve the objective?
- Can the performance of the activities be monitored?
- Have specific products been identified?
- Is there a clear understanding of the nature and scope of the product?
- Is the responsible individual clearly indicated?
- Are there sufficient resources to do each activity or produce each product within the specified time?
- Is a due date stated?

SAMPLE
CURRICULUM DEVELOPMENT ACTION PLAN *
PHASE II
Newly School District
1993-94

Curriculum Coordinator: Joanna Bond

Objectives: By April 1994, district and school personnel will have engaged in professional development activities which affect student performance

Strategies:

Specific Activity	Individual Responsible	Completion Date
1. Collect/compile a professional library on current curriculum and instructional issues	Media Specialists	January 1993
2. Provide train-the-trainer workshops	Jefferson Smith	July 1993
3. Send teachers/administrators to conferences	Joanna Bond	September 1993
4. Form and hold study groups	Principals	Continuous

Evaluation:
(Evaluation is completed as each strategy is reached.)

Budget:

A. Salaries and Benefits		C. Consultant Services	
Substitutes	$ 500	Fee	$ 500
	$ 500		$ 500
B. Travel		D. Operational Costs	
Conferences	$2,000	Materials	$ 500
Consultant Fee	500	Dues	30
	$2,500	Duplication of Materials	100
			$ 630

*The action plan is intended for local use and does not have to be approved by the Kentucky Department of Education.

Evaluating Completion of Strategies

Taking time to reflect upon and examine closely what has been accomplished is vital for successful implementation of the action plan. As each strategy is completed, evaluation of that strategy should occur. The following questions are an example of the type that should be asked:

- Is the product/activity as useful as was anticipated?
- Were the activities finished on projected completion date?
- Did the objective make a substantial difference?

Establishing a Budget

Generally the budget can be broken down into four categories - salaries and benefits, travel, consultant services, and operational costs, such as printing, materials, supplies, and equipment. Guiding questions for developing a budget might include the following:

- What personnel expenses are needed? Substitutes? Consultants? Additional clerical services?
- Are there relevant conferences, workshops, or seminars that would provide valuable information? If so, what fees and travel costs are required for participation?
- What meeting expenses are needed to support development work?
- Are there resources which would provide valuable information?
- What are the costs of materials, printing, supplies, and equipment needed to accomplish the activities?

CURRICULUM DEVELOPMENT ACTION PLAN *

PHASE II

School or School District

Year

Curriculum Coordinator:

Objectives:

Strategies:

Specific Activity	Individual Responsible	Completion Date

Evaluation:

Budget:

A. Salaries and Benefits
B. Travel
C. Consultant Services
D. Operational Costs

**The action plan is intended for local use and does not have to be approved by the Kentucky Department of Education.*

III. Comprehensive plans lead to success.

☑ C. Establishing guiding principles for instructional programs.

Guiding Principles

Guiding principles must be established for making decisions on curriculum, instruction, and assessment. These principles serve as the district's guide for implementation of the instructional program and the major factors that influence curriculum and instruction. These will provide the foundation for establishing the school or district parameters. Prior to developing the guiding principles, it is wise to formulate a series of questions. Such as,

- What will provide guidance to the development teams, teachers, and school administrators in the design and implementation of curriculum?
- What does the district believe about critical areas (e.g., content, instruction, methods)? The district's/school's philosophy might be a point of reference here.
- How do we assure that the curriculum our students experience prepares them to be successful?

Sample

Guiding Principles
Newly School or District

Guiding Principle 1: Parameters will be organized by grade level.

Guiding Principle 2: The curriculum focus must be linked to specific real-world issues, problems, and questions and must focus on academic expectations.

Guiding Principle 3: The curriculum will be designed to include both discipline-based and interdisciplinary instruction.

Guiding Principle 4: Instructional methods will include numerous opportunities for experiential learning and various forms of demonstrations of learning.

Guiding Principle 5: Curriculum and assessment will be in alignment.

Guiding Principle 6: Ongoing student assessment will include authentic open-ended, performance event, and portfolio demonstrations of learning.

III. Comprehenvise plans lead to success.

☑ D. Determine curricular parameters of learning.

Parameters

The determination of district or school parameters is recommended to assure a comprehensive, cohesive curriculum. Parameters establish the broad areas of learning, expected student demonstrations, and generic quality indicators that reflect standards of excellence. **They do not address instructional units, specific strategies, resources, or other curricular structure.** Parameters only establish the expectations for the students; they do not prescribe instruction.

Purpose

The parameters should articulate the vision held for the instructional and assessment programs. They will

- identify student expectations,
- serve as an outline for curriculum development,
- provide teachers with a guide for establishing an instructional plan for the year, and
- offer a concise way of communicating the educational expectations to parents.

It is essential that these parameters be developed by a representative group of the district's or school's teachers with input from the faculty at large. The parameters can be organized according to grade level, academic expectations, or content area; however, the organization should be based upon the format which will be of most assistance to teachers and curriculum developers.

Source

The parameters would actually establish course or grade level expectations, and they would be derived from

- the academic expectations and demonstrators provided by the state,
- essential knowledge/skills identified by local teachers, and
- knowledge contained within national standards.

Structure

The identified expectations should be clear and concise, and provide for student demonstration of achievement. Every indicator included must directly support the state's academic expectations. There is no set presentation format (e.g., separate grade level booklets, wall charts), but the selected structure should address the district's or school's needs.

Establishing Parameters

Step 1

Review and analyze the seven capacities, six goals for Kentucky's schools (refer to the Transforming the Learning Environment Section of this document), Kentucky's Learning Goals and Academic Expectations, KIRIS assessment, and the district's and school's mission statements and philosophies. Examine the implications each of them have for curriculum.

Seven Capacities

It is the intent of the General Assembly to create a system of public education which shall allow and assist all students to acquire the following capacities:

1. Communication skills necessary to function in a complex and changing civilization;
2. Knowledge to make economic, social, and political choices;
3. Understanding of governmental processes as they affect the community, the state, and the nation;
4. Sufficient self-knowledge and knowledge of his mental and physical wellness;
5. Sufficient grounding in the arts to enable each student to appreciate his or her cultural and historical heritage;
6. Sufficient preparation to choose and pursue his life's work intelligently; and
7. Skills to enable him to compete favorably with students in other states.

Step 2

Review and analyze external reports (e.g., national standards) and local issues to determine how they will impact the curriculum.

Step 3

Develop 12th grade exit standards. The district's exit standards may exceed the Academic Expectations but must not be less.

Step 4

Identify essential knowledge in each content area, based on existing national standards. Scrutinize for omission and duplication; then, "selectively abandon" nonessential content.

Step 5

Determine appropriate skill applications which show progress toward the Academic Expectations. The demonstrators in *Transformations: Kentucky's Curriculum Framework*, Volume I should be particularly helpful at this point.

Step 6

Create ongoing exit performance assessments.

Planning Instruction ➡ ➡ ➡ ➡ ➡

III. Comprehensive plans lead to success.

☑ E. Design instructional units.

Instructional Planning

Curriculum must be considered a process that continually defines and redefines the experiences students have in learning situations. It should **not** be viewed as a static, finite collection of content specifications or classroom prescriptions because it is not simply a document or defined product. **Curriculum development is an ongoing activity which is an integral part of every teacher's responsibilities.**

There is not an ideal design, preferred level, or best method for curriculum development; neither is there a single structure that addresses all needs or situations. What is critical, however, is that curriculum be developed locally by those closest to the students. In keeping with the movement toward student-centered instruction, student input should be sought throughout the instructional design process. Design, implementation, and evaluation unfold to provide the variety necessary for a relevant, world-class, learning experience.

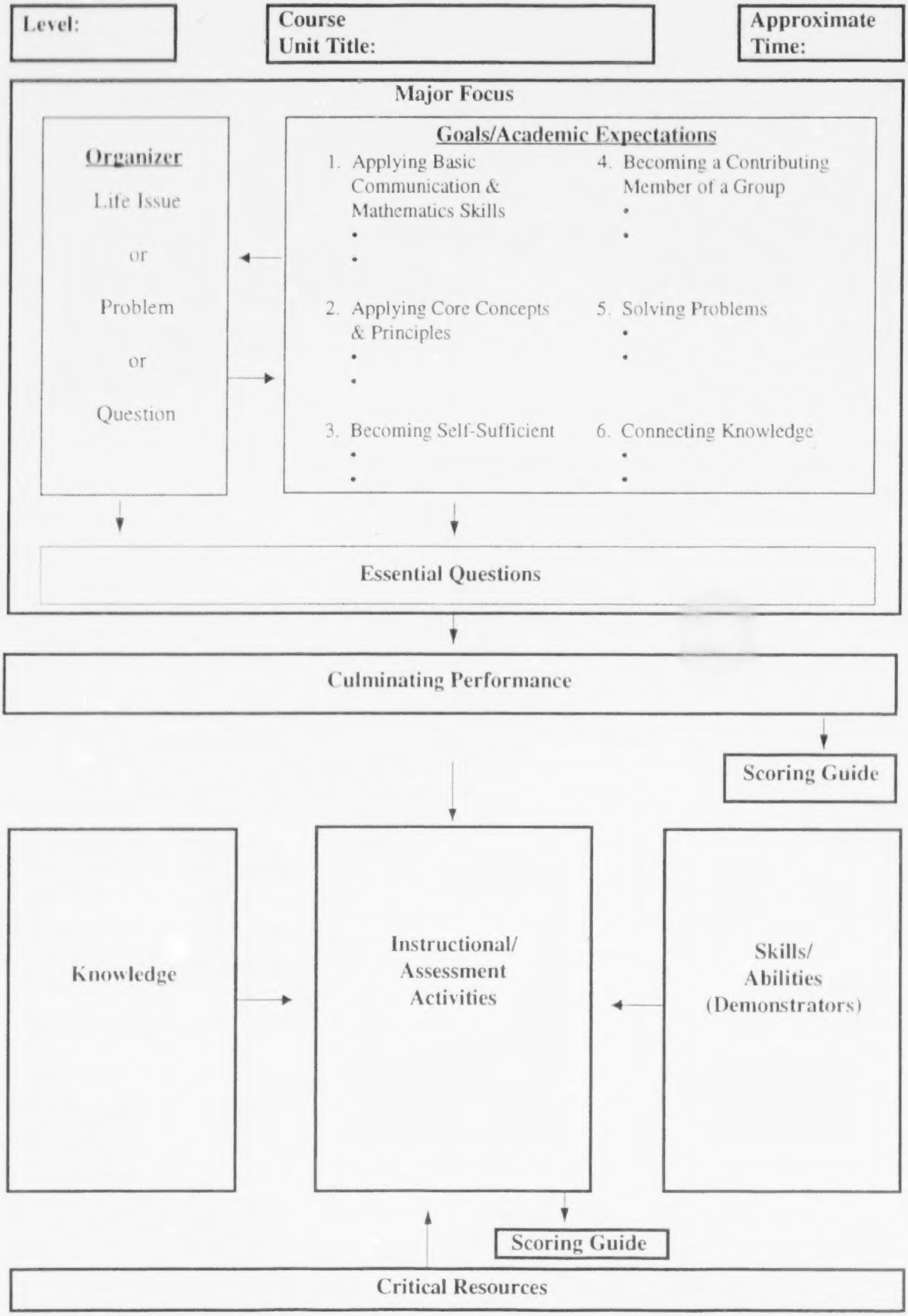
The approach to curriculum design in a standards-based educational system is different from approaches used in the past. The "Design Down" principle means that one first identifies what students are to know and be able to do upon graduation. These standards and culminating performances become the guiding principles for interim standards which, in turn, determine expectations and interim performances. These guide the daily activities and assessment. Life issues, problems, and questions, as well as the academic expectations, should be used in identifying the focus for these performances. This can be accomplished from either a disciplinary or interdisciplinary approach, and that approach may vary from unit to unit.

Within a school year, the number and length of instructional units will vary. But, the compilation of these units should address all the academic expectations. If review of all instructional units reveals less attention is being given to some academic expectations, it is imperative that the major focus and culminating performances be redesigned to incorporate those academic expectations.

In all design work, it is essential that attention first be given to what students are to accomplish and demonstrate at the end of the instructional/learning process. Once this is determined, the teacher or curriculum designer creates a map that will guide instructional activities that lead students to successful, culminating performances. This is similar to knowing the destination for a trip and identifying the most appropriate route before starting the engine.

The general planning map and explanation of each component on the following pages provides guidance in designing instructional units. The Curriculum Planning Map is just that -- a map. It is not intended that the final curriculum resemble the form, but use of the map will lead the developer through the design process.

CURRICULUM PLANNING MAP



Level:

Course Unit Title:

Approximate Time:

Major Focus

Organizer

Life Issue

or

Problem

or

Question

Goals/Academic Expectations

1. Applying Basic Communication & Mathematics Skills
   -
   -
2. Applying Core Concepts & Principles
   -
   -
3. Becoming Self-Sufficient
   -
   -
4. Becoming a Contributing Member of a Group
   -
   -
5. Solving Problems
   -
   -
6. Connecting Knowledge
   -
   -

Essential Questions

Culminating Performance

Scoring Guide

Knowledge

Instructional/ Assessment Activities

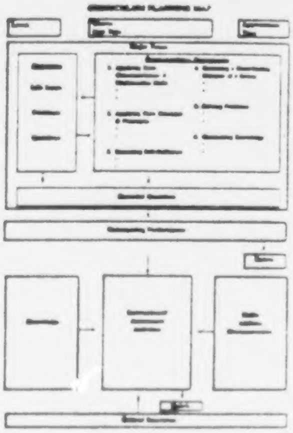
Skills/ Abilities (Demonstrators)

Scoring Guide

Critical Resources

Explanation of Planning Map Components

Identifying Major Focus →



Traditionally, the focus of a unit has been determined through a content-centered approach; but, an authentic, meaningful curriculum addresses relevant issues of self and society with the content serving as a unifying thread. Student-centered instruction addresses the personal, social, cultural, and global concerns of the students and focuses on results rather than input. In a transformed learning environment that supports KERA initiatives, identifying the major focus will involve two areas of concentration–the central organizers and the academic expectations.

As the major focus of the instructional unit is being identified, the curriculum structure should also be determined. Will the unit be discipline-based? Will it be a multidisciplinary or interdisciplinary unit? Or, will instruction be designed to move "in and out" from discipline-based instruction into one or more levels of integration? Regardless of the structure, it will be necessary to move back and forth between the organizers and the academic expectations as the major focus is identified. It is analogous to the proverbial question "which came first, the chicken or the egg?" This process ensures that

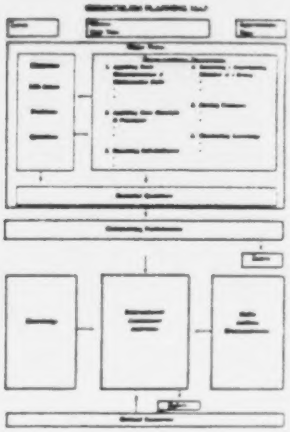
- instruction is organized around meaningful and real-life issues, problems, or questions;
- the major focus of the unit is aligned with the learning goals and academic expectations;
- content is used as a vehicle for teaching the learning goals and academic expectations; and
- curriculum is aligned with assessment.

Issues, problems, or questions that connect to real-life experiences motivate learning and should serve as the **organizers** of instruction. At the same time, it is critical to review the **academic expectations** in each learning goal and determine which might naturally be addressed in the unit. The organizers and academic expectations will guide the writers as the activities, knowledge, and skills/abilities components are developed.

A variety of approaches exists for identifying a rich, relevant unit focus. One end of the spectrum is the traditional teacher-directed approach; the other extreme is the totally student-directed approach. In between the two are varying degrees of student involvement. Because learner interest is an important motivating factor, a high level of student involvement is desirable. This becomes even more critical with each succeeding school year.

The importance of the teacher's role as facilitator and instructional guide must not be underestimated at this point. It is the skilled teacher who weaves the interests and concerns of students with academic expectations and related concepts to create an important, viable instructional focus.

Formulating Culminating Performance →



Culminating performances should result in powerful demonstrations requiring students to use knowledge and skills/abilities to extend and reflect previous learning. They provide learning experiences for all students which are appropriate, authentic, challenging, and help demystify expectations. Culminating performances allow students to

- demonstrate learning through engaging, comprehensive presentations which incorporate multiple academic expectations;
- investigate a topic in depth through the filter of one or multiple disciplines;
- organize and present a large amount of information in a coherent form; and
- develop process skills (e.g., writing, research, computer application, problem solving), discipline-specific skills (e.g., mathematical structure, application of democratic principles, analysis of form, nature of scientific activity), and personal/social skills (e.g., learning on one's own, using productive team skills).

Culminating performances can be structured as (1) a prescribed mode of presentation offering students freedom of design and topic selection, or (2) a prescribed topic or area of concentration providing for student selection of presentation format.

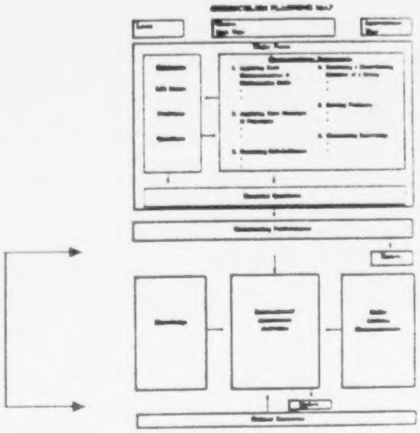
The resulting demonstration can reflect differing degrees of complexity in both focus and design while incorporating individual and group experiences. The length of time allocated to the completion of the task can vary from a few days to several weeks. The demonstration should be as much a learning experience as it is assessment. The process of application and demonstration becomes an integral part of the culminating experience and encompasses learning on multiple levels.

The intent and description of the culminating performance should address the multiple intelligences and different learning styles. The task should be authentic, address the life issue/problem/question of the unit, and be compelling to the student. The structure and design of the unit should be chosen to provide each student the greatest "stretch" encouraging achievement at the highest level.

The culminating performance serves a design function for curriculum development. Once the basic focus and design for demonstration of the selected academic expectations have been established, the supporting activities can be developed. Identification of necessary knowledge, skills, and activities forms the basis of the instructional unit and provides the design for learning experiences.

High quality culminating performances will include the following:

- products or performances
- all or most of the KERA learning goals
- multiple steps or components
- audiences beyond the teacher
- contexts (issues) of significance
- application of process and personal/social skills
- identified purpose.



Developing a Scoring Rubric

When introducing a performance task, the scoring rubric explicitly tells the students what is expected: it allows them to react to the assignment in a desired way.

The scoring rubric

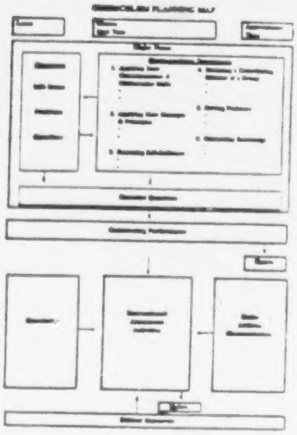
- provides indications of students' growth toward the academic expectations;
- ensures high expectations for all students;
- establishes criteria for judging the quality of student performance;
- predefines qualities for evaluating performance; and
- describes degrees of success.

The process of student evaluation no longer focuses on vague descriptions and degrees of right or wrong but on student progress. It should be viewed as a barometer for student intervention rather than as an end in itself.

The scoring rubric should be developed along with the culminating performance and should allow for different levels of response. If the task does not allow for varying response levels, the event is not a culminating performance but rather an activity. In developing the rubric, keep in mind the question, "What is the minimal response for the highest level?" Teachers often involve students in the development of the rubric. They, then, give students the completed rubric along with a model of excellent performance that assists in providing focus and identification of standards.

Learning to critique and judge the quality of one's work is embedded in KERA and standards-based instruction. Evaluation of student progress might include a continuum of self and peer assessment prior to teacher-assessment. The development of rubrics and implementation of assessment procedures for standards-based instruction is perfected over time with much practice.

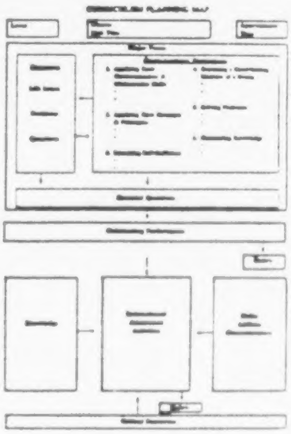
Determining Knowledge and Skills/ Demonstrators



Curriculum planners identify the essential knowledge and skills/ abilities the student must possess to successfully demonstrate the culminating performance. These knowledge and skills/abilities are the focal point from which the instructional/assessment activities are developed. The knowledge and skills/abilities may be reflected in a single discipline or expanded to address multiple disciplines as teams of teachers work toward preparing students for an interdisciplinary culminating performance. This map may be modified by curriculum planners when an integrated or interdisciplinary instructional approach is chosen.

The related concepts and demonstrators found in Volume I *Transformations: Kentucky's Curriculum Framework* are samples and may be expanded to meet the specific district/school instructional needs. The related concepts are points of reference for determining the knowledge component while demonstrators are equal to essential skills/abilities.

Developing Instructional/ Assessment Activities



The instructional/assessment activities are the heart of the teaching-learning process. These activities must reflect the academic expectations, knowledge, and skills/abilities identified for the unit. Ongoing assessment is an integral part of good instruction. It will assist the teacher in ascertaining individual student intervention needs, identifying instructional needs, prescribing appropriate instruction, determining the effectiveness of particular instructional approaches, and determining student achievement of the academic expectations.

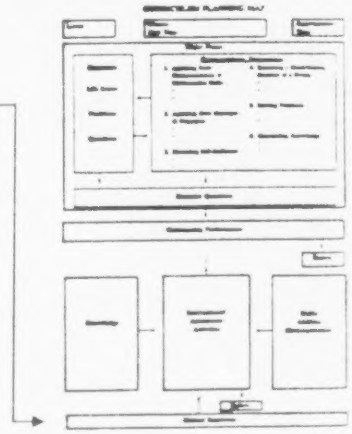
Learning activities may be developed from three major emphases: knowledge, process, and product. They must be "real" for the students if sustained learning is to occur. They must encourage divergent thinking, engage students in problem-solving, relate to and build upon personal experiences, allow for various modes of expression, encourage self-evaluation through revising and rethinking opportunities, provide for heterogeneous group work, and be free of cultural bias.

Guiding Questions

- What activities will allow the student to acquire and apply the knowledge that focuses on the real-life issue, problem, or question posed and on the academic expectations identified?
- How can appropriate process skills be incorporated into the activities? What are the appropriate process skills?
- In what ways can various learning skills, multiple intelligences, and multicultural instruction be accommodated in the activities?
- What are the teaching and learning strategies that best support the activities?
- What products will most adequately reveal the student has met the expectations of the unit?
- Are the assessment activities designed to measure process as well as product?

A scoring rubric extends from the instructional/assessment activities on the planning map to emphasize that assessment is an ongoing piece of the instructional process. The rubrics should be developed at the same time as the assessment activities that measure the students' progress toward the culminating performance are developed. Rubrics for scoring instructional assessment activities should meet the same criteria discussed earlier for developing scoring rubrics.

Identifying Critical Resources



Identifying resources that support learning is vital. In a genuine effort to get students to learn, teachers are often tempted to do too much for them. The paradigm of imparting knowledge must change to one of allowing and encouraging discovery. To facilitate this shift, every available resource should be tapped.

To make learning real for students, teachers must go beyond the traditional resource of the textbook and involve students in the identification and creation of resources. Involve parents, other community members and agencies, colleges/universities, and cross-cultural representatives in the search for resources that help to enrich the learning experiences. This provides opportunities to build a shared vision for successful student learning and capitalizes on contributions that can help make an important difference.

Active learners must have access to materials such as kits, models, packets, and manipulatives that allow for hands-on experiences. In addition, games present challenging, fun ways to learn. Using computers allows students to work at their own pace, simulate processes that are difficult to demonstrate in other ways, be creative in design, improve thinking skills, and engage in discovery learning. The video camcorder is often referred to as a learning catalyst in that it inspires creativity. Videotapes may be used in portfolio development, as feedback to students, to record "teachable moments," and to provide information on what students are learning to parents and other teachers. High quality, commercially produced videos, films, filmstrips, and slide presentations can continue to supplement instruction. However, caution should be taken regarding frequency of their use as they often place the student in a passive-learner mode.

For students, time is another critical resource. If all students are to learn at high levels, expanded learning time must be made available. Extended School Services programs which are parallel to instruction and student expectations in the regular classroom offer one method by which the expanded opportunities for learning can be provided.

IV. Successful implementation requires capacity building.

☑ A. Provide comprehensive professional development opportunities for all district/school personnel.

☑ B. Establish effective networking systems.

☑ C. Develop and implement an ongoing, systematic process for evaluating progress in a results-oriented manner.

Building Capacity

Professional Development*

A key to ensuring an internationally superior education for each child in the Commonwealth of Kentucky is the professional development of its teachers and administrators. Student performance is the bottom line for the success of a school district and school. Therefore, professional development activities that do not impact student performance are considered unsuccessful.

Schools as units are accountable for student performance. Professional development at this level must focus on teachers' abilities to enhance student performance. School plans should address specific, adaptable techniques that are directed toward the KERA initiatives and learning goals. The School Transformation Plan may be used as a guide for the professional development plan.

The Kentucky Department of Education promotes the following attributes identified by research as crucial to effective professional development:

Programs having these attributes**

- focus upon instruction and academic expectations;
- promote peer review, collegiality, and collaboration;
- encourage flexibility, experimentation, and risk taking, rather than prescribing lock-step behaviors or punishing failures;
- involve participants in making decisions about content, format, timing, implementation specifics, evaluation, and other dimensions of the professional development sessions/experiences;
- include realistic time estimates for changes in practice; participants have sufficient time to be able to learn, plan for, and try out new skills approaches, reflect on their success with helpful coaches, revise and retry, learn more, and get support for their efforts;
- increase the integration and linkages among schools, districts, and consortia;
- have the support of official leaders (e.g., superintendents, principals) who know what to expect and how to be of assistance;
- provide participants with time to work on professional development and to assimilate new learning;
- encourage participants to share and build upon their own experiences and perspectives, and acknowledge the personal concerns involved in making significant changes;
- include incentives and rewards for participation that are geared to individual participation needs, motivations, and realities; and
- address individual, school, district, and state goals, and do so in a way that uses staff development to build capabilities to implement all components of KERA.

*Source: The Kentucky Department of Education Professional Development Process Document

**Source: Dr. Susan Houcks-Horsley, the Northeast Regional Laboratory

Establishing Networks ➡ ➡ ➡ ➡ ➡

Networking Systems

The changes required for school restructuring are so significant that no single individual or group working alone can do everything needed or expected. As local curriculum is developed, it is necessary to form networks which allow for sharing of information, ideas, and knowledge in order to arrive at a shared vision. Once this vision is established, additional networks will facilitate the implementation of those ideas. The rationale behind networking can be as simple as providing a resource for answers to basic professional questions or as complex as joint research projects.

The networks may take a variety of forms, but they should include open forums which expect and encourage conversation. Two-way communication builds an environment where a shared vision can be established and maintained. School-based networks are the first step in forming more expansive professional networks which make it possible for teachers and administrators to cope with the increased levels of expectations.

Levels of Networks

- **teacher-to-teacher** - to establish appropriate student expectations for units and courses, identify critical content/knowledge, design an integrated curriculum, and address a plethora of other reasons for sharing with colleagues.
- **administrator-to-teacher** - to work cooperatively and collaboratively in curriculum design and implementation, and to provide a support structure in which instructional transformation can occur.
- **teacher-to-colleagues in other schools** - to share ideas on strategies, instructional/ assessment activities, and resources.
- **administrator-to-administrator** - to provide a sounding board for innovative approaches to restructuring (e.g., scheduling, curriculum integration, budgeting).
- **district, school, and teacher-to-community** - to communicate educational goals to the community and solicit support for attaining those goals (e.g., determining critical resources, expanding learning into the community).
- **district, school, and teacher-to-national, state, and other districts** - to access new information and resources.

The idea of two-way communication is imperative. Schools which establish viable networks within the school, with other schools, and with the larger community will discover that the changed attitude toward both knowledge and power has a synergistic effect for all parties involved.

Evaluation Process

To sustain change and continuous improvement in curriculum design and implementation, an ongoing, systematic process for evaluating all aspects of the instructional program and its support systems must be developed and implemented.

Evaluation of district/school policies, procedures, and plans which affect the curriculum development and teaching-learning processes is as important as evaluating instruction.

Staff at all levels should be involved in developing the evaluation process. Having a role in establishing the evaluative criteria; and understanding the "what, why, and how" of the process, will help to eliminate the negative connotations of accountability. This is crucial to the district/school in reaching the level of expectations and standards required for effective curriculum reform.

Sample Curriculum/Assessment Evaluation Model

Collaborative Structure

- Staff capacity has been improved through group process training.
- Committees/teams with broad representation (e.g., administrators, teachers, parents, community) have been and are continuing to be used throughout curriculum redesign process.

Shared Vision

- Evidence indicates the learning goals and academic expectations have been analyzed and internalized by the curriculum development committees/teams.
- Mission statement and philosophy were developed with input from all stakeholders.
- Mission statement served as the foundation from which curriculum decisions were made.

Comprehensive Plans

- Plans have been developed to reflect the objectives, roles, and responsibilities and to redefine and reassign as needed.
- Action plan was implemented, assessed, and redesigned.
- Evidence indicates the curriculum has been designed and implemented within the established parameters.
- Curriculum has been sufficiently validated to enhance students' achievement of the academic expectations.
- Instructional units adhere to the following:
  - reflect the academic expectations,
  - focus on real-life issues that address concerns of the students,
  - enable students to make connections across disciplines,
  - infuse cultural heritage and diversity, and
  - address all academic expectations.

Capacity Building

- Professional development activities that affect student performance have been and are continuing to be provided.
- Effective communication networks exist throughout the district.
- Curriculum/assessment management model aimed at improving rather than proving has been established and implemented.

Notes

Transformations:

Bringing It All Together

Bringing It All Together

Bringing It All Together is a guide for teachers which shows how the information found in *Transformations: Kentucky's Curriculum Framework* will influence practices in the classroom. The explanations provided answer many of the questions being posed by educators throughout the state.

Jefferson Smith, a high school American Government teacher, is used as an example of how the philosophy behind the Kentucky Education Reform Act (KERA) might be implemented in schools. Mr. Smith is fictional, but his character is based on a compilation of the experiences of many real Kentucky teachers. His story is for every teacher who has questions about how to help all students learn at high levels.

Throughout the pages that follow, Mr. Smith's words appear in italics. Additionally, examples of plans, student directions, and other work done by Mr. Smith are frequently shown. Introductory paragraphs provide readers with information which explains the philosophy and purposes of Mr. Smith's actions.

JEFFERSON SMITH

Like many of my colleagues, when the Kentucky Education Reform Act was passed by the General Assembly in 1990 I had mixed feelings about it. I realized education needed to change. I knew that any chance Kentucky had to improve itself and to become an important force in the growth of American society had to begin with the transformation of our schools.

At the same time, KERA was going to mean a lot of changes for me and the teachers at my school. Change is not always easy or welcome, especially when it affects a person's beliefs. I was skeptical about the reasons for and purposes of some changes being discussed.

After much reflection and discussion, I decided that KERA gave me the excuse to take some risks in the classroom. I owed to my students the best teaching I could provide and that was going to require some changes on my part. I also knew that the risks I took could not be based on whims. I was going to need to read about standards-based education, multiple intelligences, and other ideas that were the basis of KERA. I needed to talk to innovative teachers I knew and find new ideas. All of this was going to mean hard work and time, but teaching had always required hard work. KERA was an opportunity that could not be missed.

Getting Started

The final stage in the development of curriculum begins when teachers start planning an instructional unit. It is at this point that strategies and blueprints for student learning are organized to give life to the work of curriculum writing committees.

Determining the focus of an instructional unit is a critical first step. Selection of a focus should be guided by two considerations:

- the academic expectations and
- the central organizer.

Unit Standards

The transformation of schools envisioned by KERA is founded on a standards-based approach to education. This requires teachers to decide before they design the instructional unit what they want their students to know and do at its conclusion. Unit standards should include:

- Kentucky's learning goals and academic expectations,
- critical content,
- parameters, and
- national standards

JEFFERSON SMITH

(Jefferson Smith had always planned by focusing on the content and the textbook. Changing to a standards-based approach was the first step to be made in transforming his classroom.)

Trying to decide what I want my students to learn has been a challenge. Parameters had been established which outline courses and academic expectations, but I was in the position to decide what my students needed. Everyone of them is an individual with different needs and with different learning styles. It was my job to plan a unit which could address these needs.

I began by looking at the academic expectations I wanted my students to attain by the end of the unit. Because of the Kentucky assessment and the guidelines in our local parameters, I decided to target at least one academic expectation from each of the six learning goals. As I began planning, I decided that could not always be done because of individual student needs. Still, I always have a core set of unit academic expectations on which the whole class is focusing.

Guidance in determining unit expectations can be obtained from

- **Kentucky's six learning goals and academic expectations.** Schools and districts will be held accountable based on how well students perform on the Kentucky assessment. Questions and tasks on this assessment are based on the academic expectations. For additional insights of the intent of each academic expectation, refer to the "Reflections" section of the Demonstrator pages.

- **Local district and/or school parameters.** Many districts and schools will develop parameters as a result of KERA and the development of *Transformations: Kentucky's Curriculum Framework*. These will also prove valuable sources for deciding what academic expectation to target.

- **Individual student needs and abilities.** Accounting for these differences in students may require targeting a variety of academic expectations at any given time.

- **National standards and goals.** Increasingly, teachers are getting guidance in deciding what to teach as professional organizations are providing information about appropriate goals and standards in the content areas.

JEFFERSON SMITH

(The following example from Jefferson Smith's planning shows his targeted academic expectations. The parameters established by his district have recommended that American Government address Kentucky's academic expectations 2.14, Democratic Principles; 2.15, Political Systems; Mr. Smith decided to combine these four into one unit because of their connections.)

Targeted Academic Expectations for Unit 1:

Goal 2:

2.14	Students understand the democratic principles of justice, equality, responsibility, and freedom and apply them to real-life situations.
2.15	Students can accurately describe various forms of government and analyze issues that relate to the rights and responsibilities of citizens in a democracy.

(Mr. Smith identified several other academic expectations on which he anticipated students would need special assistance. These included the communication skills from Goal 1 and all of the academic expectations in Goals 5 and 6. He selected these because it is vital that all students communicate well, think critically, problem solve, and see connections in their learning.)

Central Organizers

Many teachers are familiar with using a central organizer as a major focus in their learning units. The organizer can take any of the following forms:

- themes,
- problems,
- concepts,
- content, or
- skills.

While determining the form is an important consideration in selecting an organizer, the substance is most important. The central organizer is the vehicle by which students are able to reach the targeted academic expectations, so teachers need to carefully evaluate what they use as central organizers. An especially important point is that an organizer is not appropriate simply because it allows students to participate in fun activities. Neither should they concentrate on trivial knowledge that is irrelevant and useless to students. Organizers should provide some organization for student learning. Anticipating what skills or knowledge students will need next year in school should not be used to justify what is taught. Education is not about preparing students to be successful in school; it is about preparing students to be successful in life.

JEFFERSON SMITH

(Jefferson Smith decided to take some time reading and researching the process of developing a major focus. As a result of his research, Mr. Smith created the rubric shown below to guide him in the process.)

Organizer Rubric

Yes No Question

___ ___ Is the organizer developmentally appropriate?
- Does the organizer ask students to work at the upper levels of Bloom's Taxonomy?
- Does the organizer require students to participate in activities in which they must apply learning in real situations?

___ ___ Is the organizer broad and deep enough to allow students to have some flexibility in what they study?
- Does the organizer encourage students to make connections between ideas?
- Does the organizer prompt students to build on prior knowledge?
- Does the organizer encourage students to demonstrate learning in a variety of ways?

___ ___ Is the organizer intriguing to the students?
- Does the organizer provoke student interest enough that they will invest time and effort to learn?
- Does the organizer demand that students use their imagination?

___ ___ Is the organizer focused on learning which can be transferred to issues which are current or will be essential in the future?
- Does the learning attained by using this organizer make a difference in the student's life?
- Does the learning achieved through the use of the organizer apply to real-life situations?

___ ___ Is the organizer going to require students to be involved in a rigorous study of content knowledge and practice of life skills?
- Does the organizer ask students to learn essential information instead of memorization of trivial facts?
- Does the organizer allow the practice of valuable skills?

___ ___ Is the organizer designed to be broken into a set of essential questions?
- Does the organizer allow for asking questions like "how," "why," and "what?"

JEFFERSON SMITH

(While listening to the radio one afternoon, Mr. Smith heard a young man state that the political system in the United States had lost touch with the people. After some reflection he decided that he would begin the school year with an instructional unit entitled "Does American Government Really Serve Its Citizens?" His vision of what this unit would be convinced him that he could check "yes" for each column on the rubric.)

I had to begin my initial planning based on my experience as to what would work and what wouldn't work in the classroom, what I knew about students, and what I had experienced as a participant in numerous classes and workshops. To some extent, I had to guess about what would work the first time I tried to use an organizer. Later, I began putting my unit expectations on a board about three weeks before we began a new unit. Then, the students and I would take a day of class to determine the central organizer for the next unit.

Essential Questions

Teachers have been organizing instruction around themes, problems, and issues for decades. Too frequently these organizers have been designed so that the learning drifts in unpredictable ways toward unwanted results. One concern when using organizers instead of a scope and sequence approach is that content is removed from the curriculum. The way to avoid this problem when developing an organizer is to create a set of guiding or essential questions.

Essential questions become the scope and sequence of the organizer. They should

- be developed with student input, where possible,
- include no more than 4 or 5, and
- be posted in the classroom.

The following criteria should be used in developing essential questions:

1. The questions should be written so every person in the class can understand them.
2. The questions should have no obvious "right" answer.
3. The questions should reflect higher-order thinking. They should require synthesis, analysis, and evaluative judgment.
4. The questions should be arranged in a logical sequence.
5. The questions should emphasize concepts while requiring students to use knowledge in developing answers.
6. The questions should cause the students' learning to uncover and recover important ideas.
7. The questions should be posed in a realistic time frame.

JEFFERSON SMITH

(The most difficult step in the process of unit development for Jefferson Smith was the creation of the essential questions. It was during this stage of development that he had to go to some of his colleagues for help.)

The first time I tried to develop a set of essential questions I ran into a lot of trouble. The initial set of questions concentrated on covering information and did not encourage higher-order thinking. Fortunately, I had a couple of friends in the building who were struggling with making some of the same changes. We decided to meet at school one day in late August and talk about our essential questions. I think we turned out to be a pretty good editing group. The essential questions we developed for our classes seemed to work really well.

After the first time, we developed a process of asking students in our classes to suggest essential questions. We brought those to an "editing party" after school where three of us would go over those suggestions and develop three to five good questions. These would then be submitted to the class for their approval.

Essential Questions: "Does American Government Really Serve Its Citizens?"

1. What does government do for me?
2. What rights do I have, where do they end, and what are the rights of all citizens under the government?
3. What responsibilities do I (and all citizens) have to government? Why do I/we have them?
4. Who makes decisions in government; who gave them the authority (or power) to make decisions; and, do I have influence over the decisions?
5. How do we keep government from getting too powerful?

Designing the Culminating Performance

Once the unit academic expectations and the organizer have been determined and have given structure to the instructional unit, the culminating performance, or final exhibition, can be designed. The culminating performance is most effective in preparing students for Kentucky's assessment if it takes the form of an authentic assessment. This type of assessment emphasizes a student's ability to problem solve, think critically, apply knowledge, and demonstrate other important skills.

Drawing from Theodore Sizer's work in his book, *Horace's School*, the guidelines which follow are offered for the development of a quality culminating performance.

Guidelines in Developing a Culminating Performance

- The culminating performance should reflect genuinely useful skills and knowledge.
- The culminating performance should raise issues that are both personal and universal. The ability of a student to perform the activity should rest on the student's ability to show he/she has a thoughtful mind.
- The culminating performance should allow flexibility in student preparation and presentation.
- The culminating performance should give students a reasonable choice of topics allowing them to investigate areas of individual interest.
- The culminating performance must require students to show a base of knowledge. While a mere recitation of facts is not desirable, students must have knowledge which can be used to organize thought.
- The culminating performance should demand intense work and preparation on the part of students. It should require persistence, organization, and inquiry skills associated with Kentucky's learning goals.
- The culminating performance must allow time for students to accomplish serious, comprehensive work.
- The culminating performance should prompt students to stretch their minds and make connections. It should put knowledge in a sensible context which supports the value of the content learned. It should assess several academic expectations targeted in the unit.

JEFFERSON SMITH

Writing the culminating performance reminded me of the writing process used by the language arts teachers in my school. I wrote a draft, revised it, and finally published it for the students. I always try to publish the culminating performance on the first day we are beginning an instructional unit. I want to make sure that the students know exactly what is going to be expected of them.

(Mr. Smith eventually created a culminating performance with two components. The first component was a required writing activity and the second involved a set of options from which the students were allowed to choose. In this way, he was able to meet the criteria for a quality culminating performance.)

"Does American Government Really Serve Its Citizens?"

Final Demonstration

During the next few weeks we will be focusing on the question, "Does American government really serve its citizens?"

The guiding questions we will use to keep us on task during this investigation are

1. What does government do for me?
2. What rights do I have, where do they end, and what are the rights of all citizens under our government?
3. What responsibilities do I (and all citizens) have to government? Why do I/we have them?
4. Who makes decisions in government; who gave them the authority (or power) to make decisions; and, do I have influence over the decisions?
5. How do we keep government from getting too powerful?

At the conclusion of our unit, you will be required to participate in the following final demonstration.

Part 1:

Write a piece which addresses the question "Does American government really serve its citizens?" The piece may take the form of any writing genre and may address any audience.

Part 2:

A. Prepare and present a formal debate on one of the essential questions. You should attempt to convince an audience (e.g., a panel of local government officials, the class) that your position is correct. Allow time at the conclusion of the debate for replies to audience questions.

B. Create a video documentary which shows investigation into one of the essential questions. Present the documentary to an audience. For example, you could arrange to have the video shown over the television cable public access channel. Your job is to use pictures, interviews, case studies, history, music, and/or words to persuade or inform.

C. Investigate a local, state, national, or global problem connected to one of the essential questions. Design and implement a program which focuses on solving the problem.

Designing a Rubric

Perhaps the most critical element of developing culminating tasks, or any type of authentic assessment, is the establishment of criteria by which to judge the tasks. This set of criteria, often referred to as a rubric, must

- explain to students (and parents) what is expected of them on the task and be given to them at the time of the assignment.
- define what different levels of performances will look like.
- enable scorers to be fair, consistent, unbiased, and accurate in evaluating the task.
- place a value on different performance levels.

Because most culminating performances are used to assess several academic expectations, it is important that teachers remember that a rubric needs a set of criteria for each targeted academic expectation.

Creating rubrics can be just as time-consuming and difficult as developing the task itself. Fortunately, there are several guides that teachers can use. These include

- the essential questions. Using these guiding questions will help ensure that students are focusing on the learning that was intended.
- the demonstrators in *Transformations: Kentucky's Curriculum Framework*. These often can be used exactly as they appear as components of the assessment criteria.
- the Kentucky Holistic Writing Guide. Because much of Kentucky's assessment requires student writing, elements of this rubric can be used repeatedly.
- other rubrics or assessment criteria. Rubrics can frequently be adapted or used as models in developing new assessment criteria.

It is essential that rubrics reflect fairness and reliability. In order to achieve these goals a rubric must be established which enables scorers to be consistent in their ratings and students to be consistent in their performances.

JEFFERSON SMITH

(Mr. Smith found several examples of rubrics in educational articles and books. He reviewed these and the resources listed above to develop his own rubrics.)

At first, I thought the creation of rubrics was going to be an impossible chore. I chose one of the culminating activities to address and I pulled from every example I could. Once I got in mind exactly what I wanted my students to be able to do and looked at *Transformations: Kentucky's Curriculum Framework* *developing the rubric did not seem to be so hard.*

I had talked to several professors at the local university and read some material on rubric design. I have to confess that in creating this set of criteria for my classroom use, I did not follow every requirement suggested. For instance, it was explained that to develop a truly reliable rubric, it had to be field tested. Obviously, that was impossible if I intended to use it in the upcoming year.

I decided to do the best I could with what I had. I determined the criteria by using the essential questions and other resources. I got feedback on the rubric from my colleagues at our "editing parties," and I got student input both before and after they did the culminating performance to make sure they knew exactly what was expected of them.

Toward the end of the year, I began to ask students to give input on designing rubrics. This was important because it allowed students to be involved in the process of self-evaluation and standard setting. I came to see this as a vital part of rubric design.

(The rubric Mr. Smith developed for the writing component of the culminating performance follows.)

"Does American Government Really Serve Its Citizens?"

Assessment Criteria for the Writing Component of the Culminating Performance

The following criteria will be used in evaluating the writing component of the culminating performance. You should use the criteria listed below in writing your piece.

A piece will receive a 3 if it

- Considers at least one of the essential questions being posed in this unit and clearly makes a connection with the unit focus, "Does American government really serve its citizens?"
- Exhibits thoughtful analysis of democratic behavior and civic responsibility. Demonstrates the author's understanding of the rights and responsibilities of citizens in a democracy.
- Draws conclusions about the relationship between authority and power in a democratic political system and clearly supports these conclusions with multiple examples or quality research.
- Establishes and maintains a clear focus and a distinctive voice. Demonstrates the author's ability to write for a purpose.
- Exhibits fluency, organization, and correctness in writing.

The piece will receive a 2 if it

- Considers at least one of the essential questions being posed in this unit but fails to clearly make a connection with the unit focus, "Does American government really serve its citizens?"
- Exhibits a superficial analysis of democratic behavior and civic responsibility. Demonstrates an incomplete understanding of the rights and responsibilities of citizens in a democracy by the author.
- Insufficiently demonstrates a relationship between authority and power in a democratic political system or fails to support opinions with examples or adequate research.
- Establishes an inconsistent focus or voice. May not demonstrate a clear purpose in the writing.
- Demonstrates a careless attempt or inadequate ability in writing fluency, organization, and correctness.

The piece will receive a 1 if it

- Does not clearly consider an essential question posed in this unit.
- Exhibits no analysis of democratic behavior and civic responsibility, or demonstrates a misconception of the rights and responsibilities of citizens in a democracy.
- Makes no attempt to demonstrate a relationship between authority and power in a democratic political system.
- Exhibits no awareness of audience.
- Demonstrates an inability to communicate through writing due to inadequate organization or errors in surface features.

The Transformed Role of the Teacher

Using organizers, essential questions, and authentic assessment strategies will require teachers to make adjustments in the way classrooms are organized and managed. Teachers may find replacements for the lesson plan format and textbooks. Indeed, the transformation of the school envisioned by KERA will require that the roles of teachers and students change. Teachers will become coaches, facilitators, enablers, and co-learners. Students will become workers, group members, and true learners. This will necessitate that teachers review the way they

- design daily instructional activities,
- assess students in daily work,
- arrange furniture in their classrooms, and
- schedule their own time and work both in and out of the classroom.

JEFFERSON SMITH

(While working through the planning map, Jefferson Smith realized that much about his classroom and his teaching would have to change.)

Once I began planning, I realized two things. I had to be the one who took the responsibility for assuring that my students were prepared to successfully complete all aspects of the culminating performance. Also, everything I did in class now should be aimed at that preparation. Using an organizer, essential questions, and a culminating performance had given my teaching a consistent focus.

(The first observable change that Mr. Smith made was in his classroom arrangement. With the consent of his principal, he was able to trade half of his student desks for tables and chairs.)

I talked to one of my friends about room arrangement. He is a primary program teacher at one of our district's elementary schools. I had a lot of questions for him. I began asking about the use of learning centers in the classroom - things like how he set them up, how he scheduled students in them, how he assessed students at the centers. His help was invaluable. I decided that the only way I could get my students to do the things I wanted them to do was to use the learning center concept.

I began each week by arranging the chairs and desks in a semi-circle in the middle of the room. I held a business meeting where I handed out schedules and addressed technical issues. The rest of the time, desks, chairs, and tables were moved around as was needed; no seating chart, no rows. At times I was concerned that my classroom was chaotic, but after I had gone through a few of the instructional units like this, I stopped worrying. The students responded very well with only a few exceptions. In fact, most reacted better than they had in the more constrained environment.

(A more significant transformation quickly took place in Mr. Smith's classroom. Instead of concentrating on content coverage, he now believed that he was responsible for teaching the whole student.)

Transforming my approach to teaching was a sobering experience. I realized that there was much that I didn't know before I started using this approach, but now it became almost overwhelming. I felt comfortable with my content area. I was worried about trying to teach reading, writing, mathematics, and all the other things with which I was not familiar.

Basically, there were two options open to me in trying to deal with this. I began to read and pose questions to the experts in my building whenever I had a concern. Obviously, my time for reading was severely restricted while I was teaching, but I never stopped asking questions. I honestly believed that my colleagues on the faculty appreciated the opportunity to talk with me about their own subject areas. From time to time, I asked teachers to trade classes during a planning period and help my students when they were having a particular problem.

My other strategy for dealing with this problem was to send students to other teachers to have their questions answered. I explained my dilemma to my students and stressed to them the importance of being courteous about getting information from other teachers for my class. In fact, we spent a brief time in class discussing this issue.

In transforming the classrooms of Kentucky, it is important that teachers realize three very important concepts:

- Teachers must become life-long learners themselves. This trait, which is a goal for all of Kentucky's students, must be modeled by teachers.
- Teachers must work collaboratively. The best lesson designs, the best teaching efforts, and the best support are discovered when teachers are talking to other teachers.
- Teachers must spend time addressing the needs of their students. The frequently cited quote, "less is more," truly does have to become a guiding principle in instructional unit planning.

(Mr. Smith began planning his learning unit trying to anticipate what the students would need but realizing that not everything could be planned in advance. He was guessing with some accuracy what students would need to know about government and politics - his content speciality. He was less sure about what would be needed in other areas.)

As I began developing plans for activities, I realized how important it was for me to spend time only on what was going to contribute to student learning. It was also evident that not all students were in need of the same information and skills. Using learning centers about once a week, collaborative learning groups, individual and group assignments, planned activities, a focused field study, and mini-lessons, I was able to make my plans flexible enough to meet the needs of most students.

(Examples of Jefferson Smith's activities appear below. For each of these activities, Mr. Smith decided to devise a rubric to help in the assessment of his students. Often, these plans had to be adapted to meet unanticipated conditions. At the end, however, many of Mr. Smith's concerns and worries had been resolved.)

Directions for Learning Center 3: Week of September 12th

You should complete steps 1-4 in one class period.

Step 1

In your group choose a discussion leader. The other three or four members should participate in the discussion as directed.

Step 2

Briefly discuss the following questions.

1. What responsibility does the government have to guarantee a fair trial for every individual who is accused of a crime?
2. If the rights of the individual appear to be in conflict with the rights of a group, whose rights should be protected?

Step 3

Read the two articles from *Time Magazine* appearing at your table. The first article deals with the Rodney King beating in Los Angeles in 1992. The second focuses on the events surrounding the verdict in the trial of the police officers accused of the beating.

Step 4

For the remainder of the class time, discuss our second essential question, "What rights do I have; where do they end; and, what are the rights of all citizens under our government?" Remember to discuss this question in the context of the articles you just read.

Additionally, consider the following:

A. Other recent news events that consider individual rights which may be in conflict.
B. Personal experiences you have had with this issue.
C. Historical examples which might shed light on the issue.

Remember, you are responsible for submitting a set of notes on the discussion or a reflection about the discussion which specifically mentions points made by individuals in your group.

Step 5

Write a first draft position paper which answers the following question:

"In a democratic government, where do the rights of the individual end and the rights of society end?" The paper is due two days after you have completed the other activities at this center.

You will have completed this activity satisfactorily when you have

1. completed the reading and discussion at the center.
2. submitted an acceptable set of notes or a reflection on the activity.
3. submitted a first draft copy of the position paper which
   a. attempts to be persuasive.
   b. uses multiple sources of support.
   c. shows understanding of the question posed.
   d. connects the writing to the discussion and reading focused on in the center.

JEFFERSON SMITH

(In order for the students to accomplish their goal on this activity, Mr. Smith had to prepare them for the task. He had already conducted a mini-lesson on what was expected of discussion leaders. In the mini-lesson, the discussion leaders learned that each member in their group should give a response every 3 or 4 minutes. They discussed how to pose questions and politely end long-winded responses. Also, the class discussed the responsibilities of group membership.

Additionally, a mini-lesson addressed the techniques of taking notes in discussion groups and writing reflections of a discussion. Some time was devoted to making sure students understood the constitutionally guaranteed rights of the accused and the historical evolution of these rights in the United States. This information was provided through reading material and small group discussions which ended with tutoring sessions—sometimes conducted by other students—for those having difficulty understanding the concepts in the lesson.

Finally, on a student by student basis, Mr. Smith had to make sure that they understood enough about the writing process to know what a first draft effort was and how to make sure the required information was in it. This first attempt to use learning centers was a learning experience for both the students and Jefferson Smith.)

Mini-lesson: Participating in a Group Discussion
Intended Number in Audience: 10 to 15
Special Strategy: Fish Bowl
Handout: "Guidelines for Participation in a Group Discussion"

Step 1

Read the accompanying handout ("Guidelines...").

Step 2

Participate in the discussion. Be sure that you understand the purpose for each point on the guidelines.

Step 3

Watch the provided 10 minute news clip. Afterwards, you will be divided into one small group of 3 to 5 and one large group made of the rest of the students. Seats will be arranged for the small group in an inner circle and the larger group in an outer circle.

Step 4

You will be given a set of questions. If you are a member of the inner circle, follow the guidelines for participating in a group discussion. If you are a member of the outer circle, evaluate the group discussion using the "Guidelines..." as criteria.

Step 5

Exchange places with members of the other group and practice group participation repeating the above steps.

JEFFERSON SMITH

Early in August I decided that I needed to have a mini-lesson on group discussions. I began planning by trying to write a traditional lesson plan with objectives and activities. I even started making out a worksheet for students to use. Doing all of this just did not seem to make any sense.

I ran across a book, The Paidiea Program *by Mortimer J. Alder, which included a chapter on conducting seminars in classrooms. Much of what I wanted the students to be able to do I got from that chapter and my own common sense. I wanted to make sure that all students participated, knew how to ask good questions, felt secure about their own ability to contribute, and could be good listeners.*

What I finally decided to do was to clarify in my own mind what the students should know about group discussion procedures. I wrote that down in my plans. Since this was just the beginning of the process of learning how to function in a group discussion, my initial objective was to develop a set of agreed-upon guidelines for the students to have when they worked in groups. These were to be posted so everybody would know them.

The day of the mini-lesson, I asked the students to write down two rules that they believed should guide people when they were involved in a group discussion. I placed them in groups of five, asked them to share their rules, discuss the need for the rules as a group, and be prepared to report their findings to the whole class.

Seven minutes later, I had them report to the whole class while a student kept a master list of rules on the board. After each group reported, we eliminated duplications. I made a couple of suggestions, only one of which was accepted by the class. Some wording was changed on a few, and a student volunteer who could print neatly wrote out guidelines on a piece of chart paper. These were posted on a wall in the room.

The process was a tremendous success. So much so that I have used it successfully for many tasks. The guidelines were accepted by all of the students most of the time. Discussion leaders were responsible for their enforcement, and seldom was there a problem. As the year progressed, we made adaptations where necessary.

Planning for Daily Activities

The Kentucky Education Reform Act (KERA) is requiring teachers and administrators to alter their views of lesson planning. No longer can a single lesson plan format serve as the basis for all lesson development. Instead, daily planning will have to

- fit in the context of the organizer,
- be flexible to meet the needs of individual students as well as classes, and
- have a clear focus with a rationale for the plans.

Often these plans will take a variety of forms as teachers begin to use different types of strategies and activities. The traditional daily lesson plan format may no longer be adequate for plans that emphasize teacher and student flexibility or require a design which allows students to individualize their work schedules.

Other strategies which can be used to keep a record of what the teacher is doing include

- logs,
- journals,
- checklists, and
- reflections.

No one method is correct, and the best method of recording what happens in the classroom is a combination of approaches. All teachers should have an idea about what will happen in their classrooms every day. But teachers have to be flexible enough to meet unexpected challenges, seize the "teachable moment," and change when the plans are not working.

JEFFERSON SMITH

(Though Mr. Smith's principal no longer used the daily lesson plan book for accountability purposes, teachers were required to keep a record of their plans. Mr. Smith decided that he needed an accurate record of what he intended to do in class. For these reasons an organized method of planning was important to him. The page below is a sample of the entries which Mr. Smith kept in his "plan binder.")

Plans for Developing Guidelines for Group Discussions

Anticipated Goal:
A chart which is developed by the students to serve as guidelines for group discussions.

Rationale:
The students need to know what is expected in group discussions before they can participate fully. Student developed guidelines will hopefully give them a sense of ownership and create an atmosphere which encourages individual responsibility. Additionally, this activity is directly related to student attainment of Kentucky's Learning Goals 1, 3-6. Specifically, this activity will help students with Goal 4 which promotes responsible group membership.

Procedure:

Step 1
2 minutes: Have students write two rules that they believe should guide people when they are in group discussions.

Step 2
7 minutes: Have the students divide into groups of 5. They should share their rules with the group. The group should determine which rules they wish to submit to the class. Other suggestions can be made if the group desires.

Step 3
15 minutes: Appoint a student recorder at the board and have each group report their list of rules to the class. Allow one question for each rule, if needed.

Step 4
10 minutes: Have students suggest duplications that exist. Make sure these are eliminated. Make suggestions of guidelines which might be needed. Allow a brief discussion about the guidelines. Ask if there are problems with any of the suggestions. If so, address them. Reach consensus as a class.

Step 5
After class: Ask a student volunteer to record completed list on a sheet of chart paper and post in the room. Amend the list as needed.

JEFFERSON SMITH

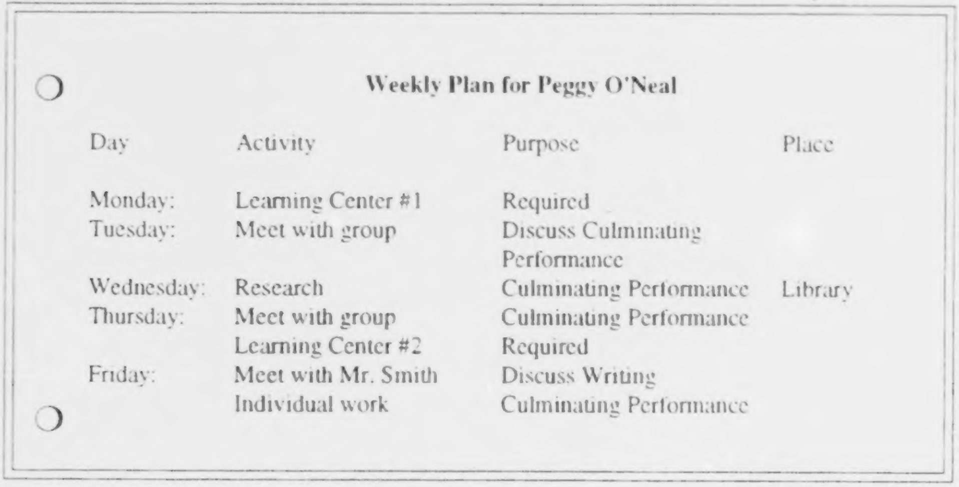
(Eventually, Mr. Smith began making it a practice to jot down a few comments about his daily plans. He noted what did and did not work and what adjustments were needed. He began to keep a binder with his plans and comments. Finally, he decided he needed to keep a log of daily activities. This was especially important on days when students were working at centers or individually. During these days, Mr. Smith was usually working one-on-one with students or with groups. On these days, Mr. Smith wrote down what he intended to do much like a doctor's appointment sheet (e.g., Second Period, 10:05 a.m., talk to Ann about double jeopardy). Keeping the log gave him the security he needed if questioned about class activities.

Jefferson Smith's classroom had taken on a new look. On any given day students would be doing a variety of activities. Some students would be at centers, some would be involved in group discussions, and some would be talking with the teacher. The classroom was a bustle of activity and learning.)

My classroom gradually became my students' classroom. They knew when they came in that they had some control over their learning. Along with that came responsibility. Not only were they going to be held rigorously accountable on the culminating performance, on intermediate assignments, and for their behavior; but they also were responsible for knowing what they were going to be doing over a period of time.

After a while, I decided that the students needed to be filing a weekly calendar explaining what they were going to be doing, why they were doing it, and where (if not in the classroom) it would be done.

They would file these on Friday, and I would review them for approval and return them on Monday. Seldom did the students file anything that I could not approve. I was able to keep up with my students, and they knew what was expected of them.



Weekly Plan for Peggy O'Neal

Day	Activity	Purpose	Place
Monday:	Learning Center #1	Required	
Tuesday:	Meet with group	Discuss Culminating Performance	
Wednesday:	Research	Culminating Performance	Library
Thursday:	Meet with group	Culminating Performance	
	Learning Center #2	Required	
Friday:	Meet with Mr. Smith	Discuss Writing	
	Individual work	Culminating Performance	

Field Studies and Interviews

An important component of a KERA classroom is the use of community resources by teachers and students. Inviting experts and community leaders into the classroom has always been done. Field studies, while meeting with many barriers, also have had their place in Kentucky's classrooms. It is the intention of KERA to give these and other uses of community resources renewed importance.

The use of community resources

- encourages students to make connections between their learning and the real world,
- allows the community to develop a vested interest in the success of the school, and
- provides opportunities for students to be active learners.

Effective use of community resources in education does not occur by accident. Using these strategies is most successful when they

- are planned with a purpose which is clear to the students,
- require some thinking and learning on the part of the students prior to the activity,
- require some thinking and reflection on the part of the students after the activity, and
- ask the students to do searching, questioning, and analyzing during the experience.

Field studies (i.e., field trips) are opportunities to provide a complete educational experience for students. While field trips were often believed to be a "nice day away from school" in the past, field studies offer students opportunities to make connections between learning in the classroom and real-world situations. By applying the strategies for effective use of community resources listed above to plans for field studies, teachers can greatly enhance these experiences.

JEFFERSON SMITH

(Jefferson Smith decided that a visit to the Circuit Court in his county would be an invaluable experience for his students.)

I had always arranged to take my students to watch a trial. We had never really done much with the trip, though. It was just kind of a neat experience and the students really enjoyed it - especially if the trial we observed involved some interesting issue.

I decided this year that what I had done in the past was not good enough. I called the Circuit Judge and discussed with her the possibility of staging a mock trial for my class. The students would sit as jurors. With much help from the judge and attorneys, I was able to make all of the arrangements.

I constructed a set of learning centers for the students and had them research some information about courts and juries. After grouping the students into jury panels, I conducted small group discussions about the functioning of courts and the expectations for jurors. Each student was asked to identify questions which might be answered during the trip. The questions could be answered through observation or by asking one of the panelists. We revisited our organizer and essential questions to make sure that we all understood the context of our field study.

Agenda For Court Day

8:30 a.m.	Depart from school
9:00 a.m.	"Court Procedures and the Role of the Judge" Speaker: The Honorable Rebekah Thomas, Circuit Court Judge
10:00 a.m.	"Attorneys and the American Legal System" Speakers: Benjamin Andrews, Commonwealth Attorney and Abigail Warren of Jones, Warren, and Associates
10:30 a.m.	***Carl Mason* v. *The Commonwealth of Kentucky***
12:00 p.m.	Lunch (provided by a local restaurant)
1:00 p.m.	Resumption of the case
2:00 p.m.	Question and answer period
3:00 p.m.	Return to school

JEFFERSON SMITH

The day after our visit to court, the students were to arrive in the classroom with answers to their questions. Using a student as a volunteer recorder, we discussed the pre-observation questions, their answers, and the verdicts reached by the juries. The students then wrote a first draft reflective essay about the field study. On the essay, students were asked to respond to the question, "Does the trial system used in America serve its citizens?"

The student essays showed that those who went on this trip learned much more than students who participated in previous trips to court. In fact, they understood the legal system better than if we had spent weeks on it in a traditional classroom. The whole experience showed me exactly what a "Classroom Without Walls" could be.

Continuous Classroom Assessment

Perhaps the most obvious change which has been brought about by KERA is in assessment. The implementation of the KIRIS assessment has prompted school districts, schools, and teachers to drastically alter assessment instruments and instruction, methods of reporting student progress, and the terminology of evaluation. The most important change in assessment, however, should be in the attitude teachers have regarding its purpose. Assessment should be

- **continuous or ongoing**. Students need to be assessed daily and weekly on their progress toward improving identified weaknesses or reaching goals.
- **flexible enough to meet the unique needs of each student**. The continuous assessment needs to concentrate on identified areas of weaknesses or goals for each student.
- **non-cumulative**. The assessment is not an averaging of grades but is, instead, a constant observation of progress.
- **progressive**. Once a student demonstrates improvement toward a goal, the assessment does not stop. Progress should be monitored and checked over and over. Student progress should also be continuous.

When using various forms of authentic assessment, it is important that teachers plan instructional units which will help students perform well. Teachers should have a reasonable degree of certainty that students can demonstrate any knowledge, skill, or process which is being required on an assessment. In this way, assessment and instruction are intertwined.

JEFFERSON SMITH

(Mr. Smith had to adjust his daily routine in the classroom. No longer was he the focus of attention for 50 minutes. Instead, the learning became the focus. His time was now filled by helping students find information, discovering ways of enabling them to accomplish tasks, and continuously observing students at work and learning. This assessment became vital as the basis for discovering strategies and methods to help students.)

I began to realize how critical it was that I keep daily records about what was happening with each of my students. Sometimes, I was trying to do so much that I really was having trouble remembering everything that had happened. Eventually, I decided that I had to develop a recordkeeping system.

Once again, I called my friend who taught a primary program class for advice and help. He explained that he carried a stack of 3x5 index cards as he circulated around the room. As he was talking to students, he would take notes on the cards and place the student's name at the top. At the end of the day, he placed the cards in a set of folders. He had one folder for each child.

In the folders were a few pages on which he recorded student goals, student progress, and student movement to a higher level or additional goals. This information was transcribed from the cards.

I adapted this strategy for my classes. Of course, I had more folders to keep but each student was focusing on fewer goals in my class. This is a time consuming process, but it had some major advantages. I was so familiar with the students' work that I really did not have to spend additional time assessing final products. Also, I had supporting evidence for my evaluations. I never had any problem explaining how a student was assessed. Actually, the more I used this system, the easier it became. At a conference I heard that there will soon be bar coding technology available for classroom recordkeeping. When our school can purchase that, it will be a tremendous time-saver.

(Mr. Smith also kept in the students' folders copies of work they had done and the assessment sheets which had been used to evaluate the work. This "working portfolio" was available to students on request and was extremely helpful when students had to assemble their portfolios for the state assessment program.)

Daily Evaluation Log for Nathaniel Jones

Goal:

10/15 Recognizes issues of justice, equality, responsibility, choice, and freedom and makes applications to real-life situations. (2.14)

10/17 Nate seems to comprehend the concept of majority rights but is having difficulty understanding the importance of minority rights. Suggested he read section on "Rights" in textbook and a couple of articles on the topic. We are to conference before school on 10/21.

10/21 Beginning to show an understanding of minority rights. Still needs to apply it. Suggested he call our state representative (the Minority Leader in the Senate) and two minority members of our staff.

We need a more complete understanding of equality. Nate is still conceptualizing equality in terms of property. Considering trying to get him to join Martha, Raymond, and Joan in a reading group to read *Animal Farm*.

10/28 Early this week, observed Nate explaining to a friend why Tony should be allowed to wear a shirt with a political message on it. GOOD JOB!

Will begin reading *Animal Farm* in class today.

Finding Time for It All

Throughout the implementation of the Kentucky Education Reform Act (KERA), one of the major concerns of teachers has been finding time to do everything. The transformations required by KERA do demand much of teachers. Educators across the state are already discovering ways to save time.

- Continuous classroom assessment actually is a time-saving strategy. It allows teachers to spend less time on traditional grading activities. Much of the time spent in assessing students is done in school. Also, because teachers are continuously reviewing student work and are more familiar with what they are doing, relatively little time is needed in the final assessment of student products.

- The principle of "less is more," used as a guide, can also help teachers save time. Spending less time attempting to cover vast amounts of information and organize minute facts will allow teachers to spend more time helping students learn.

- Students can also become time savers for teachers. Much of the research and outlining that have been required to develop good lessons can now become the domain of the student. This can free teachers to spend time reading about and discussing professional concerns which seldom get the attention they need.

- Teachers need to be involved in restructuring the school day. Finding creative ways to organize the school day around time blocks, teaching teams, or central organizers can not only enhance student learning but also enable teachers to share duties, collaborate on plans, and work cooperatively.

- The changes demanded by KERA should be viewed as evolutionary not revolutionary. Few will feel comfortable, at first, with all of the changes taking place. Experience and experimentation will reveal new ways in which to use time more efficiently.

JEFFERSON SMITH

(Jefferson Smith had trouble at the beginning trying to do everything. The extra-curricular activities, a constant need to study new ideas, and a family at home created an almost intolerable amount of pressure.)

To be honest, by the middle of October, I felt like there was no way I was going to be able to keep up the pace. The excitement of the beginning of the school year wore off too quickly. After the strain became obvious to my principal, she came to my room one afternoon and talked to me about the changes I was trying to make in my teaching.

The principal explained that she supported everything I was doing. She said the methods I was using were supported by all of the reading she had been doing. But, she also reminded me that there was life beyond school, and I was not expected to create the perfect classroom overnight.

After that talk, I became much more relaxed. I really began enjoying teaching again. I cannot tell you that all of this did not take more time. I used every strategy I could find to ease the pressure. What worked best, though, was that I established "no-work times" after school and on weekends. No matter what, I would not do work for school during those times.

Even though I was working harder than I had ever worked before, I found it more challenging, more consequential, and more fun. I got to know my students better; in fact, we even had a few social activities. For instance, we had an election night party in the cafeteria at school. I think I learned as much as the students did.

Jefferson Smith did find time to make some significant alterations in his teaching. To get started it had been necessary to make several changes at once. After school had begun, however, it was easier to make adaptations if he went slowly and tried one new strategy at a time.

He continued to study ideas which he thought could help him improve his classroom. One member of his "editing party" suggested that they might become a study group. They began reading books about topics like multiple intelligences and interdisciplinary teaching.

Jefferson Smith's experience in transforming the learning environment is important to understand. It shows how KERA has enabled teachers in Kentucky to fulfill the commitment they made when they began teaching-the commitment to improve the lives of all students in the Commonwealth by helping them achieve a meaningful education. The Reform Act places responsibility for that education squarely on the shoulders of the students and teachers who are most involved in the process. It also enables them to successfully make an educational transformation by providing the needed tools. In the end, KERA will succeed because it is founded on the philosophy that all students can learn at high levels.

Notes

Transformations:

Resources

Transformations:

Resources
Teaching/Assessment Strategies

Teaching/Assessment Strategies

Mrs. McDowell's class will focus on physical wellness issues for the next several weeks. One of the tasks is to create a physical fitness program for 6th grade teachers. To accomplish the task, students can choose the most appropriate strategy from those Mrs. McDowell has modeled, such as writing questions for interviewing fitness professionals, working on a group investigation, or developing a flowchart for the program.

Introduction

The Kentucky Education Reform Act (KERA) charges schools with the task of providing students with the necessary tools for lifelong learning. Students who possess a variety of methods to approach learning will have a greater chance of becoming independent, "strategic" learners.

As students learn differently and their needs vary, using only one instructional strategy is not sufficient. Teachers can use strategies to help students learn, assess the degree of learning, and determine how well a learner has transferred the strategy into a personal learning tool. The learning environment must take students beyond rote learning into a level of discovery and exploration.

After districts and schools restructure their curricula, they should incorporate into their instructional program the strategies which will assist students in reaching the academic expectations. Instruction on using a strategy should begin with teacher modeling, proceed to student implementation with corrective feedback, and be followed by the student completing the task independently. Through this process, students have an opportunity to internalize the strategies presented to them .

Active Involvement

To provide teachers and curriculum developers with a variety of tools to meet individual differences and needs of students, a compilation of strategy components and their descriptions are detailed in this section. The strategies presented encourage active learning, discovery, and exploration.

Lecture, the most common strategy currently used in classrooms, is not included because it does not encourage active learning. As an adaptation, a 7-10 minute lecturette strategically placed within a lesson *can* be valuable in teaching a concept. Teachers should also create "attention-getters" during the lecturette by using techniques such as rhetorical questioning or telling students to "Turn to your partner and see what he/she thinks."

On the next page is a list of **Key Teaching/Assessment Strategy Components**. As these are being reviewed, remember the following:

- The strategies listed are organized in categories strictly to be helpful to teachers; they are not "theoretically" categorized.
- The strategies are both processes and products; they are not in parallel structures.
- The strategies overlap into other categories; they are not mutually exclusive.

The only man who is educated is the man who has learned how to learn...how to adapt and change.
Carl Rogers, *Freedom to Learn, 1969*

Key Teaching/Assessment Strategy Components

- I. **Foundation Strategies p. 91**
  - Activating Prior Knowledge
  - Metacognition
  - Modeling
- II. **Collaborative Process p. 93**
  - Cooperative Learning
  - Peer or Cross-Age Tutoring
  - Reciprocal Teaching
- III. **Community-Based Instruction p. 97**
  - Field Studies
  - Mentoring/Apprenticeship/Co-op
  - Networking
  - Service Learning
  - Shadowing
- IV. **Continuous Progress Assessment p. 99**
  - Anecdotal Records
  - Checklist
  - Conferencing
  - Interviewing
  - Observation
  - Performance Events/Exhibitions
  - Portfolio Development
  - Self-assessment/Reflection
- V. **Graphic Organizers p. 109**
  - Advance Organizers
  - Compare/Contrast Structures, Venn Diagrams, Matrices
  - Flowcharts, Sequence Chains, Time Lines
  - Graphic Representations
  - KWL
  - Mapping/Webbing
  - Notetaking
  - Storyboard
  - Story Map
- VI. **Problem Solving p. 119**
  - A. **Process**
    - Brainstorming
    - Discussion
    - Heuristics
    - Inquiry/Investigation/Experimentation
    - Questioning
  - B. **Product**
    - Case Studies
    - Creative Problem Solving/Future Problem Solving
    - Debate
    - Formulating Models
    - Interviews/Surveys/Polls
    - Oral History
    - Research
    - Role-play
    - Simulations
- VII. **Technology/Tools p. 128**
  - Adaptive Devices (digitized audio, video)
  - Calculators
  - Computer Utility (databases, spreadsheets, graphics, wordprocessing)
  - Data Collection Tools (lab probes, zap shot cameras)
  - Design (e.g., CAD-CAM)
  - Distance Learning, Teleconferencing
  - Games
  - Interactive Video
  - Manipulatives
  - Multimedia (Videodisk, CD ROM)
  - Puppets
  - Telecommunications
  - Video/Audio Production/Videotaping
- VIII. **Whole Language Approach p. 133**
- IX. **Writing Process p. 136**

I. Foundation Strategies

Activating Prior Knowledge
Metacognition
Modeling

Three strategies are being called "foundation strategies" because they are the basis for many others. They are used continually in the classroom, often simultaneously with other appropriate strategy components.

Activating Prior Knowledge

Associating new information with what is already known, activating prior knowledge, is an academic expectation of KERA Goal 6. Activating prior knowledge enables the learner to relate the knowledge previously learned to the current information being processed and to make predictions. The influence of prior knowledge on comprehension is very powerful and should be continuously activated by teachers and students to promote learning. This can help students see central and recurrent patterns in and across content areas and realize that what they know can be applied to what they are learning.

Many of the strategy components included in this subsection combine to activate prior knowledge. For example, brainstorming, mapping, and KWL help students recognize knowledge they already have which relates to new readings or processes.

Metacognition

Metacognition refers to the awareness and control learners have on their cognitive processes. Proficient learners demonstrate the following metacognitive skills:

- recognizing when they have a problem learning;
- spotting inconsistencies and incompatible assumptions in their own thinking;
- knowing when to consciously apply a variety of problem-solving strategies to explain why they made a particular decision; and
- applying self-monitoring techniques (e.g., frequent checking, goal setting, reassessing, and evaluation).

"Unless the curriculum embodies good models of thinking (within materials and within the teacher) and students have plenty of opportunity to practice thinking, there is no chance that students will learn to think better." **Howard Gardner,** *ASCD Curriculum Update, June 1992*

What can teachers do to develop metacognition in students?

- Share and model self-monitoring processes.
- Explain strategies that students can use.
- Clarify why particular strategies are helpful and useful.
- Clarify and model when particular strategies are appropriate.

What can students do to develop metacognition?

- Learn to "track" their thinking processes in a lesson by asking "What did I do?"
- Learn to change their thinking patterns to work more effectively for them by asking, "How could I improve?"
- Learn to use other resources for increasing skillful thinking by asking, "What help do I need?"

Modeling

Teachers should purposefully model their use of strategies so that students can emulate them. "Think Alouds" allow teachers to verbalize all their thoughts for students as they demonstrate skills or processes. Some points to be included in Think Alouds follow:

- Make predictions or show students how to develop hypotheses.
- Describe visual images.
- Share an analogy which links prior knowledge with new information.
- Verbalize confusing points.
- Demonstrate fix-up strategies.

These should be identified by teachers so that students will realize how and when to use them. After several modeling experiences, students should practice using the strategy in pairs. Ultimately, students should work independently with the strategy, using a checklist to monitor usage of the critical points for Think Alouds.

Think Aloud

Make Predictions:
"From the title I predict that this section will tell how airplane pilots adjust for winds."
"In this next part I think we'll find out what caused these plane crashes."

Describe Images:
"I have a picture of this man in my mind. He looks like a nice, well-dressed business man."
"I can see the horse kicking down the stable door as the flames come closer."

Share Analogies:
"This is like a time when I was late for school and it began to thunderstorm."

Verbalize Confusing Points:
"I am not sure how this fits in."
"This is not what I expected."

Demonstrate Fix-up Strategies:
"Maybe I'll reread this."
"Perhaps I better change my picture of what is happening."

II. Collaborative Process

Cooperative Learning
Peer or Cross-Age Tutoring
Reciprocal Teaching

Collaboration means working with at least one other person to attain a goal or objective. The collaborative process applies the concept "two heads are better than one" to the learning environment. Two or more students are given an objective or goal to work toward. Objectives and goals of collaboration are achieved because students learn to depend upon and use each others' strengths to solve problems. Collaborative experiences engage students in an interactive approach of processing information which supports

- greater retention of subject matter,
- improved attitudes toward learning, and
- enhanced interpersonal relationships among group members.

Team work, group dynamics, and self discovery are often results for individuals involved in a collaborative process.

Cooperative Learning

Cooperative learning is an extensively researched instructional method in which students are divided into small groups (2 - 6 members) to achieve a common goal or task. The groups are chosen heterogeneously and attention is given to different social backgrounds, skill levels, physical capabilities, gender, and learning styles. The students work collaboratively with all participating, but each is held individually accountable for academic performance and social behavior. To enhance the productivity of the group and to develop social skills of individuals, students are taught appropriate collaborative skills. The teacher observes both academic and social behavior and intervenes as necessary to guide, redirect, and clarify.

Cooperative learning helps to eliminate competition between students and facilitates the achievement of group goals that could not be achieved individually. There are many cooperative learning techniques and structures. The chart on the next page includes examples and descriptions of a few techniques.

Cooperative Learning Structures

Structure	Brief Description	Functions: Academic, Social (*Italics*)
Teambuilding		
Roundrobin	Each student in turn shares something with his or her teammates.	Expressing ideas and opinions, creation of stories. *Equal participation, getting acquainted with teammates*
Classbuilding		
Corners	Each student moves to a corner of the room representing a teacher-determined alternative. Students discuss within corners, then listen to and paraphrase ideas from other corners.	Seeing alternative hypotheses, values, problem-solving approaches. *Knowing and respecting different points of view, meeting classmates*
Communication Building		
Match Mine	Students attempt to match the arrangement of objects on a grid of another student using oral communication only.	Vocabulary development. *Communication skills, role-taking ability*
Mastery		
Numbered Heads Together	The teacher asks a question, students consult to make sure everyone knows the answer, then one student is called upon to answer.	Review, checking for knowledge, comprehension. *Tutoring*
Color-Coded Co-op Cards	Students memorize facts using a flash card game. The game is structured so that there is a maximum probability of success at each step, moving from short-term to long-term memory. Scoring is based on improvement.	Memorizing facts. *Helping, praising*
Pairs Check	Students work in pairs within groups of four. Within pairs students alternate-one solves a problem while the other coaches. After every two problems the pair checks to see if they have the same answers as the other pair.	Practicing skills. *Helping, praising*
Concept Development		
Three-step Interview	Students interview each other in pairs, first one way, then the other. Students each share with the group information they learned in the interview.	Sharing personal information such as hypotheses, reactions to a poem, conclusions from units. *Participation, listening*
Think-Pair-Share	Students think to themselves on a topic provided by the teacher; they pair up with another student to discuss it; they then share their thoughts with the class.	Generating and revising hypotheses, inductive and deductive reasoning, application. *Participation, listening*
Team Word-Webbing	Students write simultaneously on a piece of chart paper, drawing main concepts, supporting elements, and bridges representing the relation of ideas in a concept.	Analysis of concepts into components, understanding multiple relations among ideas, differentiating concepts. *Roletaking*
Multifunctional		
Roundtable	Each student in turn writes one answer as a paper and a pencil are passed around the group. With Simultaneous Roundtable more than one pencil and paper are used at once.	Assessing prior knowledge, practicing skills, recalling information, creating cooperative art. *Teambuilding, participation of all*
Inside-Outside Circle	Students stand in pairs in two concentric circles. The inside circle faces out, the outside circle faces in. Students use flash cards or respond to teacher questions as they rotate to each new partner.	Checking for understanding, review, processing, helping. *Tutoring, sharing, meeting classmates*
Partners	Students work in pairs to create or master content. They consult with partners from other teams. They then share their products or understanding with the other partner pair in their team.	Mastery and presentation of new material, concept development. *Presentation and communication skills*
Jigsaw	Each student on the team becomes an "expert" on one topic by working with members from other teams assigned the corresponding expert topic. Upon returning to their teams, each one in turn teaches the group; and students are all assessed on all aspects of the topic.	Acquisition and presentation of new material, review, informed debate. *Interdependence, status equalization*
Co-op	Students work in groups to produce a particular group product to share with the whole class; each student makes a particular contribution to the group.	Learning and sharing complex material, often with multiple sources; evaluation; application; analysis; synthesis. *Conflict resolution presentation skills*

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Peer or Cross-Age Tutoring

Peer or Cross-Age Tutoring is a technique where students provide academic assistance to peers or younger students. It casts one student in the role of teaching another student and provides an alternative for direct teacher-to-student interaction. This process helps students think through procedures and concepts thoroughly enough to teach others and reinforces their own present knowledge.

Since the students work together and are responsible for each other's learning the difference in their ability should not be so great as to intimidate a partner nor so similar they are unable to aid each other's progress. However, strong evidence exists that students at every level of achievement can be effective tutors. Low achievers can demonstrate they are capable of learning and helping others learn. High achievers develop a sense of responsibility for those less advanced.

Demonstrating the concept "You learn what you teach," tutors encounter opportunities to review basic skills without embarrassment, gain experience in applying academic abilities, and develop insight into the process of teaching and learning. Tutees receive individualized instruction while working with positive role models.

Tutorial grouping is most effective when it is not used excessively so that the chosen students do not feel isolated from their classmates. Below is an example of a management device which may be useful. The form is filled out initially by the teacher and then later taken over by the tutor and tutee as more responsibility is allotted to them.

Peer or Cross-Age Tutoring
Names: Bryan/Doug
Subject: Science

Date	What I Plan To Do Today	What I Did Today
10/05	Monitor, observe, and record the progress of my 5 types of growing crystals. Write down at least 2 observations/measurements of each type of crystal.	I carefully studied the crystal growth and completed today's chart for each type of crystal.
10/08	Study display case on insects in the classroom with partner. Choose 3 insects. Write 3 facts about each from the resource center.	I chose spiders, roaches, and flies. I found 6 resources from which to write similarities of each.

Reciprocal Teaching

Reciprocal teaching, an interactive dialogue between the teacher and students about content/material, helps students learn how effective readers process information.

The teacher first models the technique, providing practice time for students to take turns being "the teacher," while the teacher monitors progress and provides feedback. When students are proficient at using the technique, it can be incorporated into cooperative learning activities. There are four steps involved in implementing the reciprocal teaching strategy.

Step 1 - Summarizing- Students restate what they have read in their own words. They work to find the most important information in the text. Initially, their summaries may be of sentences or paragraphs but later should focus on larger units of text.

Step 2 - Generating Questions- Students ask questions about the material. In order to do this, they must identify significant information, pose questions related to this information, and check to make sure they can answer their own questions.

Step 3 - Clarifying- Students focus on the reasons why the text is difficult to understand, (e.g., new vocabulary, unclear reference words, and unfamiliar concepts). Students may clarify or ask for clarification in order to make sense of the text.

Step 4 - Predicting - Students speculate on what will be discussed next in the text. To be successful, students must recall relevant background knowledge so they can connect what they are reading with what they already know.

Reciprocal teaching can be used across the curriculum and at all developmental levels. See the example below:

Reciprocal Teaching in a 1st Grade Classroom -- Excerpts

Teacher, *introducing the story*: Today we will be reading a story called "The Snowshoe Rabbit." Does anyone have a prediction about what this story will be about?

Traver, *predicting*: It might tell...he lives in the snow probably...and it might tell you...if he's got shoes or something.

Teacher: It did say snowshoe, didn't it?

Manny, *predicting*: It might just be that his feet really look like shoes.

Teacher: Those are all good predictions. Let's see if this is what the author wrote. *Reads the first sentence of the story*: How far can you jump? *Asks the children*: What do you think the author is going to tell us?

Meara: How far the rabbit can jump.

Teacher, *reading from the story*: "A snowshoe rabbit can jump 15 feet." *Asks the children*: Did Meara make a good guess?

Teacher continues to read the first paragraph describing the speed and strength of the snowshoe rabbit. She then calls on the child who is to lead this portion of the discussion.

Teacher: Troy is our teacher.

Troy, *questioning*: How fast does the rabbit run?

The group talks about how fast and far a snowshoe rabbit runs and the reasons why.

Troy, *summarizing*: This part told us about why he can go far and he can jump fast. *Predicting*: It might tell us where he lives, what state he's in.

The teacher continues to read the next part of the story which describes where the snowshoe rabbit lives and what it looks like, including its hind feet and coloring. The reading is interrupted once by a child asking the teacher to clarify hind. Meara is the next discussion leader and begins questioning about how the snowshoe rabbit gets its name. Then she summarizes. And so the story goes.

Adapted from "Collaborative Research and Development of Reciprocal Teaching" by Annemarie Sullivan Palincsar, Kathryn Ransom, and Sue Derber, *Educational Leadership*, December '88/January '89.

III. Community-Based Instruction

Field Studies
Mentoring/Apprenticeship/Co-op
Networking
Service Learning
Shadowing

Community-Based Instruction (CBI), sometimes called **Community-Based Learning**, provides students with learning experiences in real life situations and settings. It enables them to relate school work to knowledge and skills needed for work in community agencies. The approach offers an alternative to the student who enjoys working with people to achieve a goal and uses the community in a partnership with the school. The experiences may be short- or long-term and must be coordinated through the school with instructional expectations clearly defined.

The 10th grade students at David School have dropped out of regular school and are trying to get their diplomas in an alternative setting. Under the leadership of their teacher, the students chose to meet their science objectives by engaging in a project to clean up the local fishpond. Using scientific procedures and the process skills, the boys have been bringing the pond and its surroundings back to life.

Field Studies

A Field Study is a planned learning experience which involves an educational trip to places where students can observe first-hand and study directly in a real-life setting. Students prepare before they go, and plan discussions for the time they are there. They make notations of their observations and record actual experiences. Teachers may use this to clarify comprehension and stimulate discussion and critical thinking.

Before going to see a nuclear reactor, Mrs. Rosenberg asks her students to form cooperative groups to list what they already know and what they want to learn while on the field study. Each group researches data about nuclear reactors. When they return from the outing, each group will report to the class:

- *Facts they thought they knew about nuclear reactors but then found were incorrect.*
- *New things they learned that went beyond what they thought they knew.*
- *Questions they had that were answered as a result of the field study.*
- *Questions that were not answered that they would be willing to investigate.*

Mentoring/Apprenticeship/Co-op

Mentoring matches students with a person in the community. Their relationship can be from a variety of different perspectives (e.g., cultural, social, shared interest in computers).

Apprenticeship matches students with community people who can transmit professional skill and knowledge to the students through collaborative work projects. This approach is helpful to students who learn best by visualizing and imitating. The trade industry often uses the concept of apprenticeship through on-the-job-training.

Richard Targett, a manager in Salomon Brothers' investment banking firm in Brooklyn, was a 1991-92 mentor to Malcolm Lane IV, a student at Paul Robeson High School for Business and Technology. He advised Malcolm about college, found physics tutors for him, and played math games with him. In the spring of 1992, Malcolm was voted the king of his prom and became the first high school graduate in his family. In the fall, he began City College of New York to study engineering. When friends ask him where he's going, he responded, "I'm going to success."

Excerpted from "Why Kids Should Learn About Work," by **Alan Deutschman**, *Fortune*, August 10, 1992.

Cooperative Education (Co-op) is a method of instruction that uses parallel or alternating patterns of paid work experiences with periods of school attendance. A training agreement and a training plan are drawn up between the school, the student, parent of a minor, and the employer so the work and school experiences are planned and correlated to meet the student's specific occupational goals. Student experiences include professional or technical learning, or personal service, such as at a day-care center.

Networking

Networks are formed to facilitate researching information. Involving students in a network is motivational, meets the needs of many students, and facilitates interdisciplinary learning. Networking, via telecommunications, allows students to collect data not only in their school or community but also around the state, country, and world.

Service Learning

Service learning engages young people in significant, genuine service to their school, community, and environment and gives them the opportunity to learn through reflecting on the experience. Youth service learning contributes to the development of the student in such areas as personal growth, career exploration, understanding of community and citizenship, social science skills, and communication skills. It seeks to instill compassion for others as a pervasive social value. Reflecting about the learning from the experience is critically important to the success of the program and is the factor which differentiates service learning from community service.

Service learning exposes its participants to a variety of views and encourages them to reflect on their experiences and think critically. It requires that young people be viewed as competent, capable contributors to their community instead of passive recipients of education. Teachers become mentors and guides rather than presenters of information. The entire community is enhanced by service learning as participants become infused with creativity and enthusiasm for having been involved with positive actions.

Shadowing.

Shadowing is a short-term experience that provides the student an opportunity to observe the events that occur within a work context. For example, a student studying government might shadow the mayor at a town meeting or one studying health might shadow a healthcare professional.

IV. Continuous Progress Assessment

Anecdotal Records
Checklists
Interviewing/Conferencing
Observations
Performance Events/Exhibitions
Portfolio Development
Self-assessment/Reflection

This section describes a variety of assessment strategies. These strategies can provide students with opportunities to participate in learning experiences and receive evaluative feedback. Teachers can use the strategies to make adjustments in curriculum and instruction.

Anecdotal Records

Anecdotal records are carefully documented accounts of a child's progress, including milestones particular to the child's social, emotional, physical, aesthetic, and cognitive development. Recording is informal, positive, unforced, and done while actual activities are occurring. They are objective, factual observations of a child and his/her work. As Wendy Hood says in *The Whole Language Evaluation Book*, "...using the documented data, adding further explanation that draws on the mental notes made on each child that come to mind when the samples are reviewed, we show how much that child grew, how far that child came, all the things that child knows about school and about doing."

Anecdotal records may be helpful for the following:

- noting student's changes and growth over time,
- evaluating the student's progress in a non-threatening environment,
- utilizing information for conferences without needing extra interpretation,
- maintaining a readily accessible tool for evaluation,
- reviewing more aspects of development (e.g., preferences, social environment, attitudes) than standardized tests can evaluate, and
- guiding changes in instruction and curriculum.

Notepads, sticky notes, or checklists with space for notes can be used for recording. The following is a teacher's suggestion about anecdotal records.

ANECDOTAL RECORDS

With the current emphasis on alternative-assessment and student-observation methods, the following technique aids in the record-keeping process:

1. *Keep a clipboard with sheets of computer labels attached.*
2. *Set up a three-ringed notebook with individual pages containing each student's name and any other information you may deem necessary.*
3. *As you observe the students, jot down pertinent information on the label; include the student's name and the date.*
4. *At the end of the week, simply peel the labels and affix them to the individual student's pages in the three-ringed notebook.*
5. *Read the observations at the end of each day so that you know what skills students need reinforced over the next several days. These pages are also great references for parent-teacher conferences.*

2/1: Donald
Tried to get group working together. Encouraged the group to try another solution path. Talked about the strategy of working backwards.

From the file of Felicia A. Coletti, Oviedo, FL 32765

"From the File Treasury" *Arithmetic Teacher*. Edited by Jean M. Shaw, NCTM, 1991.

Checklists

Checklists are simple and efficient ways to collect and organize information about students. Sometimes checklists are viewed as a statement of class goals as well as a record of what is already occurring in the classroom. Some suggestions for checklists follow:

- Focus on four or five students each day or each period.
- Use the checklist periodically to get a broad picture of students' attitudes, level of participation, and improvement.
- Give students a copy of the checklist and ask them to evaluate themselves; select one area of the checklist and ask them to write a detailed self-evaluation of their performance in that area.

The technology exists for teachers to use a bar code technique, such as the British Columbia's computerized management assessment, to record information so that it can be more quickly collected, organized, and interpreted.

Two examples of checklists follow this page.

CHECKLIST
An Instrument to Assess Individual Problem-Solving Processes
Individual Problem-Solving Assessment Record

Pupil ______________________ Class ______________________

Activity/Date																					
Chooses procedures																					
Explains procedures																					
Demonstrates persistence																					
Monitors progress																					
Strategizes																					
Exhibits accuracy																					
Exhibits flexibility																					
Total possible																					

Chooses procedures

Initially and consistently chooses the appropriate procedure to solve the problem (s) 2
Eventually chooses the appropriate procedure for solving the problem(s) 1
Does not choose the appropriate procedure for solving the problem(s) 0

Explains procedures

Fully explains the logical reasons for selecting the procedure used 3
Gives incomplete explanation or makes minor errors in reasoning for selection of procedure 2
Exhibits major flaws in reasoning used to select procedures 1
Cannot explain reasons for selecting procedure(s) 0

Demonstrates persistence

Continues to address problem regardless of difficulties encountered 2
Requires encouragement to continue work or gives up when difficulties are encountered 1
Does not attempt problem or gives up easily when encountering difficulties 0

Monitors progress

Continually monitors progress during problem-solving process 2
Occasionally checks work or checks only after completion of work 1
Does not check work 0

Strategizes

Uses a variety of strategies to help clarify and solve problem(s) 4
Consistently uses only one strategy regardless of effectiveness 2
Uses no identifiable strategies 0

Exhibits accuracy

Gives 100% accurate answer 2
Gives inaccurate answer owing to minor computational errors 1
Gives inaccurate answer owing to major computational or procedural errors 0

Exhibits flexibility

Can identify and demonstrate other appropriate methods of attacking the problem(s) 2
Can suggest other possible methods (appropriate or not) or can proceed with a given alternative strategy 1
Cannot suggest other possible methods and cannot proceed with a suggested alternative strategy 0

CHECKLIST: EVALUATING STUDENT BEHAVIORS

Measuring Thought Processes in Behavior
Demonstrating Skill and Participation Levels

Name ______________________________

Numerical Value
0 = Dependent
1 = Needs Support
2 = Independent

SPECIFIC SKILLS	**DATE**			**COMMENTS**
Understands Problem - paraphrases - recalls problem				
Formulates a Plan - selects strategy				
Implements Plan - carries out strategies				
Explains Plan - orally and in writing				
Evaluates/Interprets Metacognition Results - orally and in writing - demonstrates solution				
Extends - creates own problem - recalls related problem				

ATTITUDES (Interaction and Participation)

Cooperates				
Shares/Collaborates - tries, contributes ideas				
Questions Peers - encourages others to participate				
Takes Risks - confidence in own ability				
Stays on Task - perseveres				

Interviewing and Conferencing

Interviewing and conferencing allow teachers opportunities for obtaining information regarding a student's thoughts, understandings, and feelings about a given subject area. An interview includes a planned sequence of questions; whereas, a conference implies discussion with students and teachers sharing ideas. This process is beneficial to both students and teachers. A student receives encouragement and feedback from the teacher and is given unique opportunities to develop learning potentials. Although time-consuming, teachers find conferences and interviews help diagnose the needs of individual students and can provide valuable information about the direction of instruction for a class.

Sample Questions for Interviewing/Conferencing

1. **Task Comprehension**
   (*Can students understand, define, formulate, or explain the task?*)
   * What is the task about? What can you tell me about it?
   * What do you know about this part?
   * Would you explain that in your own words?
2. **Approaches and Strategies**
   (*Do students have an organized approach to the task? How do they record? Do they use tools appropriately?*)
   * Where could you find the needed information?
   * What have you tried? What steps did you take?
   * How did you organize the information? Do you have a system, a strategy, a design?
3. **Relationships**
   (*Do students see relationships and recognize the central idea?*)
   * What is the relationship of this to that?
   * What is the same? What is different?
4. **Flexibility**
   (*Can students vary the approach if one approach is not working? Do they persist? Do they try something different?*)
   * Is there another way to draw, explain, or say that?
   * Would another recording method work as well or better?
   * What else have you tried?
5. **Communication**
   (*Can students describe the strategies they are using? Do they articulate their thought processes?*)
   * How would you explain this process to a younger child?
   * Would you reword that in simpler terms?
   * How would you explain what you know right now?
6. **Curiosity and Hypotheses**
   (*Do students show evidence of conjecturing, thinking ahead, checking back?*)
   * What do you predict will happen?
   * How do you feel about your answer or response?
   * What else would you like to know? What do you think comes next?
7. **Self-Assessment**
   (*Do students evaluate their own processing, actions, and progress?*)
   * What are your strengths and weaknesses?
   * What have you accomplished?
   * Was your own group participation appropriate and helpful?

Observations

Students may be observed in either an individual or a group setting. The purpose of the observation may be to determine a student's competence in a given subject area or to determine affective characteristics such as behavior or attitude. Victoria, British Columbia uses a computerized observational assessment program, "Learner Profile," which allows teachers to use a light pen to record these observations as denoted by bar codes.

The following is an example of more general attributes to be assessed through observations:

Students' disposition toward learning

- Planning before acting and revising plans, when necessary;
- Sticking to the task without being easily distracted;
- Becoming actively involved in the problem;
- Using technology or other needed tools effectively;
- Explaining organizational and content specific ideas;
- Supporting arguments with evidence;
- Asking probing questions;
- Completing the task; and
- Reviewing the process and the results.

Group work

- Dividing the task among the members;
- Agreeing on a plan or structure for tackling the task;
- Taking time to ensure that all members understand the task;
- Using the time in a productive way;
- Remembering to record results; and
- Considering seriously and using the suggestions and ideas of others.

Communication

- Discussing for clarification of the student's own ideas and to communicate to others;
- Communicating a process so that it is replicable;
- Having the confidence to make a report to the whole class;
- Representing capably and fairly a group consensus; and
- Synthesizing and summarizing the student's own or a group's thinking.

Subject-specific attributes may also be assessed through observations. An example from mathematics follows:

- Selecting and using appropriate measurement instruments;
- Extending and describing numeric or geometric patterns;
- Estimating regularly;
- Using visual models and manipulative materials to demonstrate mathematical concepts;
- Showing relationships among perimeter, area, and volume; and
- Making connections among concrete, representational, and abstract ideas.

Adapted from *Mathematics Assessment: Myths, Models, Good Questions, and Practical Suggestions*, NCTM, 1991.

Performance Events/Exhibitions

To prepare students for future success, both curriculum and assessment must promote the kind of performance which people encounter in the real world. People are recognized for the tasks or projects they do, their ability to work with others, and their responses to problem situations. A performance event or exhibition is an assessment based on an observation of a student's actual performance on a given task or project.

Performances or exhibitions should

- be core performances, roles, or situations that all students should encounter and be expected to master;
- be authentic, meaningful, rich, engaging, feasible and active;
- assess the academic expectations which all students are expected to meet; and
- be complex with multiple solutions.

Job roles provide ample opportunities for designing tasks. Some of these follow:

- engineer—bid and meet specs for largest-volume container or build a working roller coaster;
- ad agency director—design advertising campaigns or book jackets;
- psychologist—conduct surveys or perform statistical analyses;
- archaeologist—determine the culture or time frame of a mystery artifact or person;
- expert witness to Congress—testify for or against advertising claims or regulation of children's television;
- commercial designer—propose artwork for public buildings; and
- policy analyst—predict the future in a country being studied.

In designing a task, teachers should begin with an idea (from life, a magazine, book, or conversation), consider the way students can communicate their responses, determine academic expectations, consider materials needed, determine whether it should be individual or group, define levels of performance, and develop an evaluation rubric.

Portfolio Development

A portfolio is a showcase or collection of student work completed over a period of time. This form of assessment enables students to present their best thinking and creative work. The portfolio should include a variety of assignments and projects from a broad curriculum (while using various resources, manipulatives, and tools).

The focus in student portfolios is on these items:

- student thinking,
- growth over time,
- connections with other subjects,
- views of oneself as a learner, and
- problem solving.

Contents of a portfolio could include the following:

- report of a group project;
- problems made up by the student;
- excerpts from a student's daily journal;
- draft, revised, and final versions of student work, including writing, diagrams, charts;
- a photo or sketch made by the student of his/her work with models or manipulatives;
- notes from an interview or conference;
- teacher-completed checklists;
- an autobiography;
- work which integrates other subject areas;
- work which shows the student's correction of errors or misconceptions;
- artwork done by the student;
- a letter from the student to the reader of the portfolio, explaining each item;
- copies of awards or prizes; and
- video, audio, and computer-generated examples of student work.

It is helpful for students to keep separate working portfolios and assessment portfolios. The working portfolios hold student work for a period of several weeks. At the end of the time period, they can review their working portfolios to create assessment portfolios.

The work in the portfolio may be re-entered for revisions, extensions, reflections, and introspection. The advantages of portfolios over other assessments are that they give a more complete picture of the student's achievement and provide an opportunity for conversations or conferences about the content.

Self-Assessment/Reflection

Reflecting on one's learning is a continuous process which enables the student to become an independent learner. It is a powerful method which also promotes metacognitive skills and ownership of learning.

Students who think about and discuss their progress toward the achievement of goals and the learning of concepts, on the basis of the evidence they see in their own work, will build better understanding and control of their own success.

Responses to self-assessment provide significant insight into student learning which aids in diagnosing problems, adjusting teaching strategies, and planning instruction. In students' self-assessments, teachers should look for

- signs of change and growth in attitudes, understandings, and achievement;
- alignment of students' beliefs about their performance with their actual performance; and
- a match between students' and teacher's views of expectations and criteria for evaluation.

Some ideas for self-assessment are to have students

- Collaborate with peers for editing/checking and rewriting/reworking.
- Complete checklists where they can regularly share concerns and successes with teacher.
- Examine their work, portfolios, and journals for evidence of growth or change in their self-confidence or their understanding. Then, ask them to write a summary of their progress.

One way to help students be more in control of their own learning, thinking, and productive efforts is to foster goal setting, designing strategies, implementing these strategies, and reflecting on progress. Goal setting is one of those strategies transferable to any domain of life. Ask students questions such as "When you wanted to get a bicycle for your birthday, what did you do?" or "When you wanted to get a better grade, what did you do?"

Two examples of a self-assessment are on the following page.

A Sample Self-Assessment Response Sheet

Name ______________________________ Teacher ______________________________

Class ______________________________ Date ______________________________

- Write down the two most important things you have learned during the past month.
- Write down at least one sort of task you have continued to find difficult.
- What would you most like more help with?
- How do you feel in ______________ class at the moment? *(Circle the words that apply to you.)*
  a)Interested b)Relaxed c)Worried
  d)Successful e)Confused f)Clever
  g)Happy h)Bored i)Rushed
  j)Write down one word of your own ______________________
- What is the biggest worry affecting your work in ______________ at the moment?
- How could we improve ______________ class?

A Sample Self-Assessment Form

Student Name ______________________________ Date ______________________

	Very Well				Very Poorly
1. How well do I compare information? My comments and examples:	1	2	3	4	5
2. How well do I classify information? My comments and examples:	1	2	3	4	5
3. How well do I make inductions? My comments and examples:	1	2	3	4	5
4. How well do I make deductions? My comments and examples:	1	2	3	4	5
5. How well do I analyze errors? My comments and examples:	1	2	3	4	5
6. How well do I construct support? My comments and examples:	1	2	3	4	5
7. How well do I make abstractions? My comments and examples:	1	2	3	4	5
8. How well do I analyze perspectives? My comments and examples:	1	2	3	4	5

V. Graphic Organizers

Advance Organizers
Compare/Contrast Structures,Venn Diagrams,Matrices
Flowcharts, Sequence Chains,Time Lines
Graphic Representations
KWL
Mapping/Webbing
Notetaking
Storyboards
Story Maps

Graphic organizers provide a visual, holistic representation of facts and concepts and their relationships within an organized frame. They aid learning and thinking by helping students and teachers represent abstract information in more concrete form, depict relationships among facts and concepts, relate new information to prior knowledge, and organize thoughts for writing. Graphic organizers exist in a variety of forms.

Graphic organizers may be used *before* an instructional activity (e.g., reading, viewing a film) to activate prior knowledge, to provide a conceptual framework for integrating new information, and to encourage student prediction. *During* instruction, they can help students actively process and reorganize information. *After* instruction, they may be used to summarize learning, encourage elaboration, help organize ideas for writing, provide a structure for review, and assess the degree of student understanding.

Teachers should describe the purpose of a new graphic organizer when introducing it to students. They should also model its use and provide ample opportunities for guided practice. When students are choosing a particular graphic structure to use, they should ask themselves questions such as: Are concepts presented in a hierarchy? Does the text suggest a time line of information? Does the author compare and contrast two or more concepts? Is the text an explanation of something?

Advance Organizers

An advance organizer is a road map— a short set of verbal or visual information presented prior to learning a larger body of content. Advance organizers become conceptual "bridges" from the prior knowledge to the information to be learned. They give the student a "what to look for" frame of reference or provide hooks or anchors to knowledge previously acquired. They may give the student background information and/or assist the student to remember and apply old information.

Advance organizers are usually given at the beginning of the lesson but may be used as the lesson unfolds to reinforce and direct student thinking. Examples include, but are not limited to, stating clear and interesting objectives and expectations, making generalizations, defining terms, reviewing previous learning, personalizing the learning, and making analogies. Advance organizers are included under Graphic Organizers but do not *have* to be graphic.

Teacher's Sample Cue Card for Using an Advance Organizer

Review Previous Learning	"Okay, let's go over the steps that we discussed yesterday." "Where could you use this at school or at home?"
Personalize	"What do you think would happen if you used this in...?" "Tell me why you think this is going to help you."
Define the Content	"That's right, but what's a...?" "What are you going to be learning?"
State Expectations	"What do you think I am going to do?" "Remember, today you are going to be involved in...."

Compare/Contrast Structures, Venn Diagrams, Matrices

Compare/Contrast Structures, including Venn Diagrams and Matrices, are visual organizers that compare and contrast characteristics of information or ideas. The selected format will depend on the subject area and the student's learning preference.

Compare/Contrast Matrix

	Attributes	Object 1	Object 2
1			
2			
3			

Similar/Different

Subject A ____________________ **Subject B** ____________________

Similarities

____

____

____

____

Differences

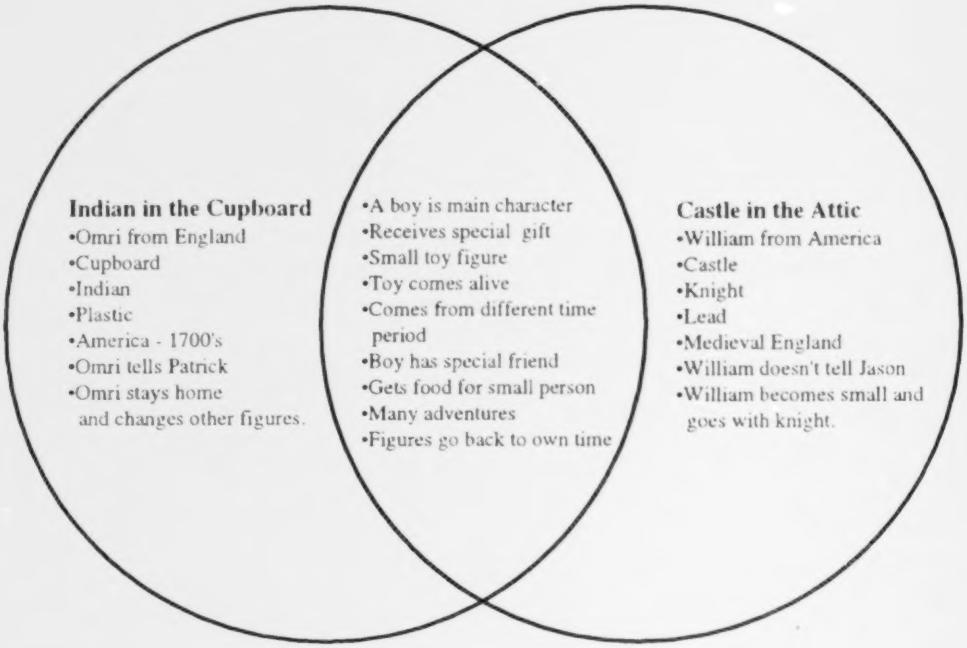
____________________ ←——————→ ____________________

____________________ ←——————→ ____________________

____________________ ←——————→ ____________________

Venn Diagrams

1. Comparing the books *Indian in the Cupboard* by Lynn Reid Banks and *Castle in the Attic* by Elizabeth Winthrop

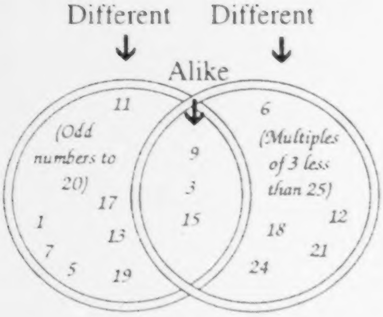


Indian in the Cupboard
- Omri from England
- Cupboard
- Indian
- Plastic
- America - 1700's
- Omri tells Patrick
- Omri stays home and changes other figures.

- A boy is main character
- Receives special gift
- Small toy figure
- Toy comes alive
- Comes from different time period
- Boy has special friend
- Gets food for small person
- Many adventures
- Figures go back to own time

Castle in the Attic
- William from America
- Castle
- Knight
- Lead
- Medieval England
- William doesn't tell Jason
- William becomes small and goes with knight.

2. Comparing two sets of numbers


Different
Different
Alike
11
(Odd numbers to 20)
17
1
13
7
5
19
9
3
15
6
(Multiples of 3 less than 25)
12
18
21
24

Comparison Matrix

	Dogs	Snakes	Birds	Horses	Cats
Hair	+	-	-	+	+
Barks	+	-	-	-	-
Four Legs	+	-	-	+	+

- is different

+ is similar

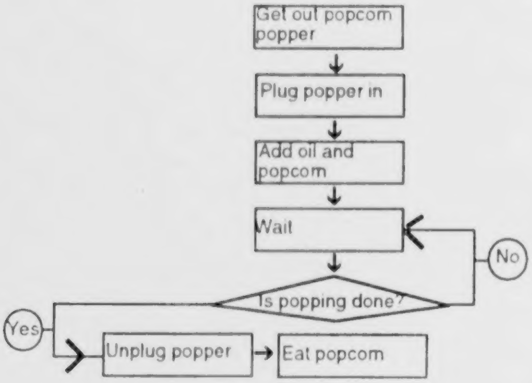
Flowcharts, Sequence Chains (Series of Events Chains), Time Lines

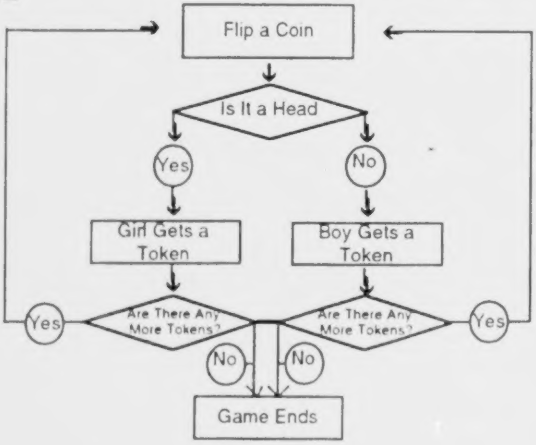
Flowcharts, Sequence Chains (Series of Events Chains), and Time Lines are diagrams that represent a sequence of events, actions, or decisions.

Flowcharts are particularly useful for

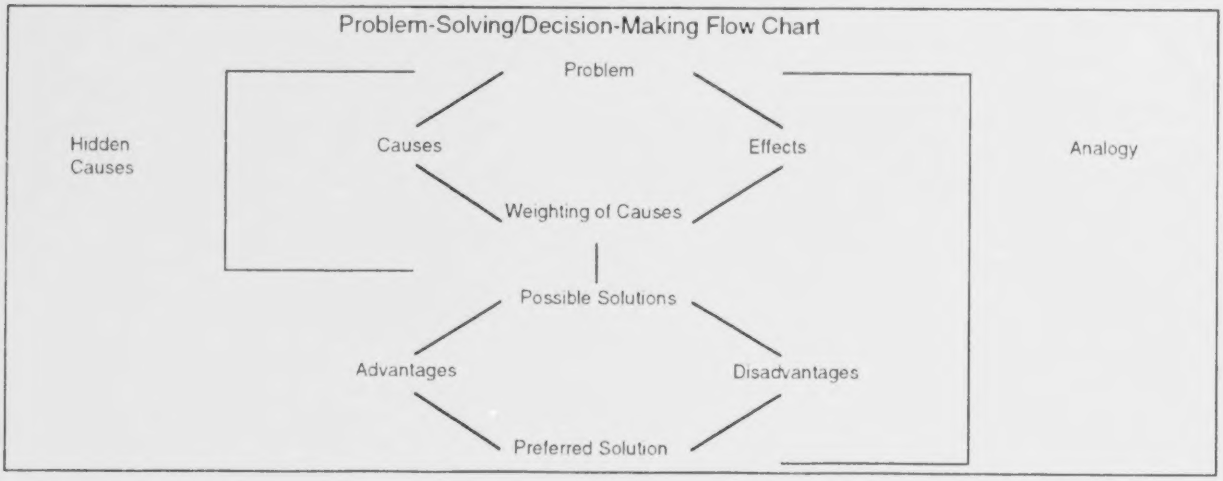
- depicting social or natural cycles,
- solving mathematics and scientific problems, or
- depicting the consequences of decisions.

Flowcharts


Get out popcorn popper
Plug popper in
Add oil and popcorn
Wait
Is popping done?
No
Yes
Unplug popper
Eat popcorn


Flip a Coin
Is It a Head
Yes
No
Girl Gets a Token
Boy Gets a Token
Are There Any More Tokens?
Are There Any More Tokens?
Yes
Yes
No
No
Game Ends

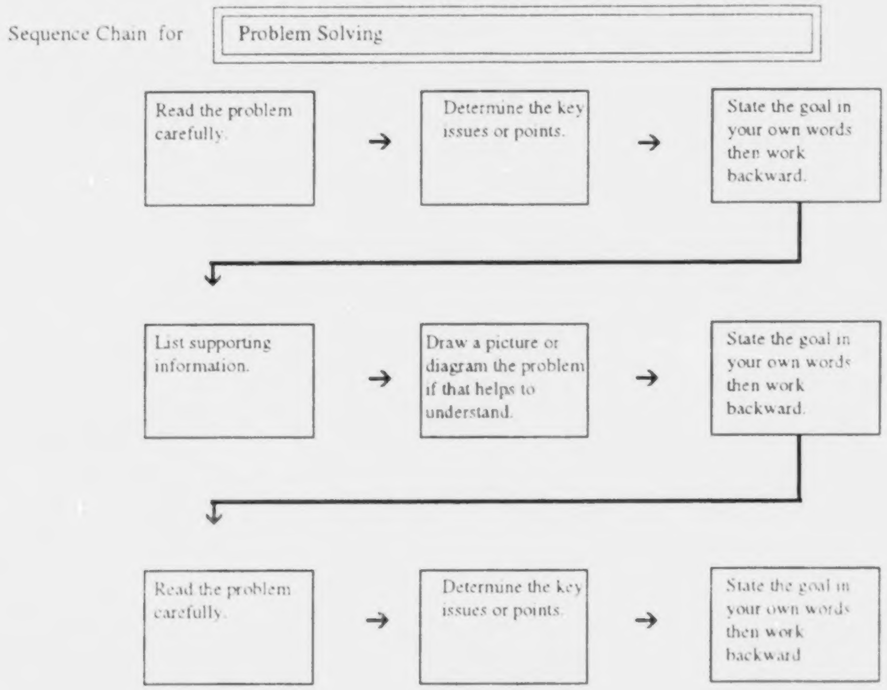
The problem-solving/decision-making flowchart closely follows the way most people solve problems and helps students understand the advantages of having an organized approach to problem-solving. It was developed by G. Eley and F. Lyman (*Maryland A.T. E. Journal*, Spring, 1987) to help teachers and students with classroom problems and decisions.


Problem-Solving/Decision-Making Flow Chart
Problem
Hidden Causes
Causes
Effects
Analogy
Weighting of Causes
Possible Solutions
Advantages
Disadvantages
Preferred Solution

Sequence Chains can be used to

- sequence events in plots, historical eras, or laboratory instructions;
- picture stages in the development of organisms, social trends, or legislative bills; or
- plan a course of action.

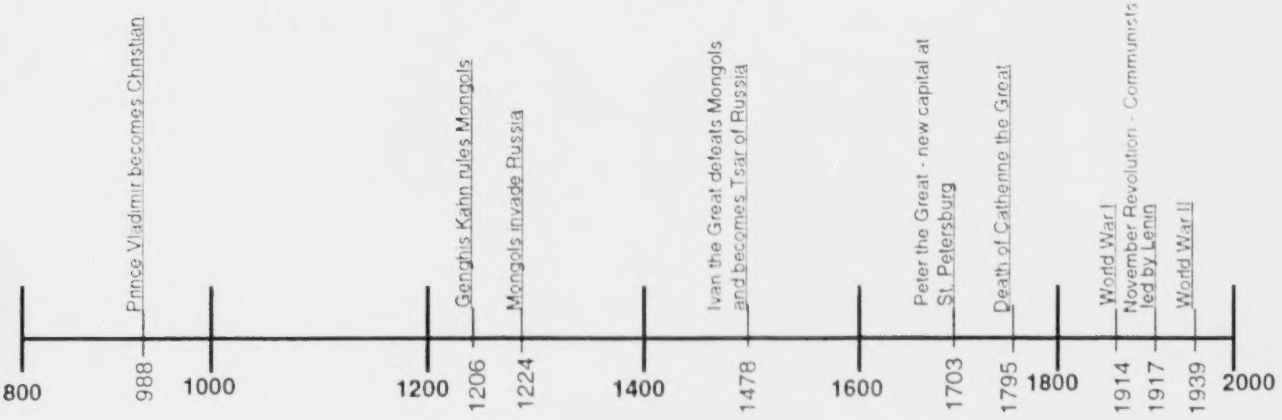
Sequence Chain


Sequence Chain for
Problem Solving
Read the problem carefully.
Determine the key issues or points.
State the goal in your own words then work backward.
List supporting information.
Draw a picture or diagram the problem if that helps to understand.
State the goal in your own words then work backward.
Read the problem carefully.
Determine the key issues or points.
State the goal in your own words then work backward.

A Time Line is used to record and correlate events with given dates and depict correlations or parallels between events occurring at the same time (use two time lines). Shelf paper, adding machine roll paper, string, or tape measures can be used to design time lines.

Time Line

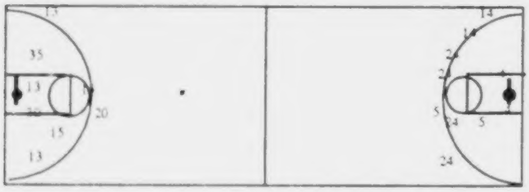
(events in Russian history)

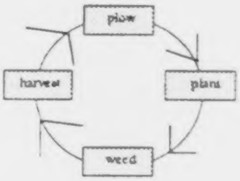

Prince Vladimir becomes Christian
Genghis Kahn rules Mongols
Mongols invade Russia
Ivan the Great defeats Mongols and becomes Tsar of Russia
Peter the Great - new capital at St. Petersburg
Death of Catherine the Great
World War I
November Revolution - Communists led by Lenin
World War II
800
988
1000
1200
1206
1224
1400
1478
1600
1703
1795
1800
1914
1917
1939
2000

Graphic Representations

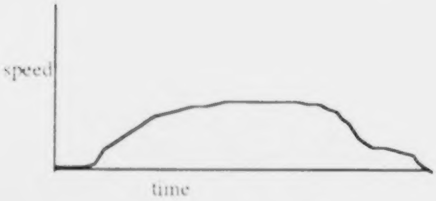
Graphic Representations are also Graphic Organizers and the terms are sometimes used interchangeably. The differentiation made for this section is that Graphic Representations are visual illustrations of verbal statements, learning aids that use symbols to create a picture of the structure of the material. They may not indicate *relationships* between ideas as organizers generally do. Examples of graphic representations follow:

Iconic strategies are personalized representations using drawings or sketches (e.g., basketball game, cycle graphics).





Other examples are graphs and charts such as the speed/time graph and the long distance phone call chart below.



Mileage	Day Rate	Evening Rate	Night/Weekend
1-10	$.30 / minute	$.22 / minute	$.18 / minute
11-16	$.32 / minute	$.23 / minute	$.19 / minute

Mathematics uses many graphic representations particular to the subject. Students need to be able to understand their meaning in order to be able to read and communicate mathematically.

Know/Want/Learned (KWL)

Know/Want/Learned is a strategy that models the active thinking needed when reading new material or participating in a learning activity. It encourages the student to think about ideas and to ask questions while reading. The letters KWL represent what students **KNOW** about a topic, what they **WANT** to find out or learn, and what they **LEARNED** as they read. The strategy is a five-step process that can be used across the curriculum, at all grade levels, with any size group or with a whole class.

Step 1 - Preparation - The teacher determines a key concept from the material to be studied.

Step 2 - Group Instruction - Students brainstorm what they already KNOW about the topic and try to create general categories as two or more pieces of information group together under a category. The teacher models the thinking-aloud process while identifying, combining, and categorizing information. The teacher asks students to think about the categories of information they would expect to find, and these are listed so that students see them.

Step 3 - Individual Questions - They record what they feel confident they KNOW about the concept under "What I **K**now" on the KWL chart (see below). Under "What I **W**ant To Find Out," students list questions or information they might WANT to learn. Students are encouraged to generate questions from information gleaned as they brainstormed and as they read.

Step 4 - Reading the Text - The text should be divided into manageable segments based on the student's needs and abilities. Some students may be able to read only one or two paragraphs. The intent is for the student to monitor comprehension by referring to the questions listed. In this way, students become aware of what they learn. They should jot down the answers to their questions as well as new questions under "What I **L**earned."

K-What I Know	W-What I Want to Find Out	L-What I Learned
had ceremonies	*Did Indians live in one place?*	*many differnt tribes in America*
ate berries	*Did they use stone tools?*	*used many differnt kinds of tools*
lived in America	*Did they domesticate the dog?*	*rode horses, had dogs*
lived in teepees	*Did they believe in spriits?*	*cooked many dishes*
hunted	*How did they make pottery?*	*lived off the land*
made canoes		*had sophisticated religion*

Step 5 - Reflection - Engage the students in a discussion about what they learned from reading. When all questions have been answered, the student's summary of the material may be a starting point for a writing assignment.

KWL Plus is a modification of **KWL** which also includes a semantic map and/or a summary of the material.

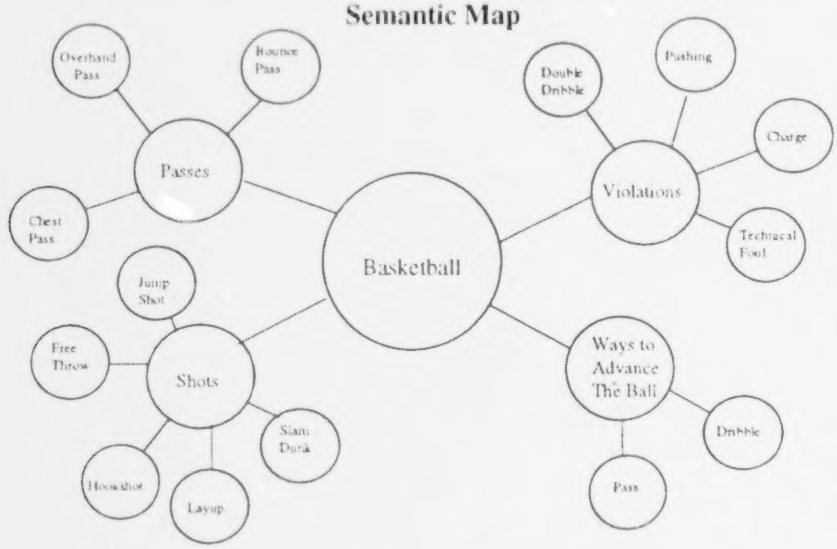
KWWWL is a modification which includes "Where they need to go to find it," and "What they want to do with it."

Mapping/Webbing

Students use mapping/webbing to indicate the relationship between ideas in text. The symbols indicate that one item is an example of another item, occurred before another item, etc.

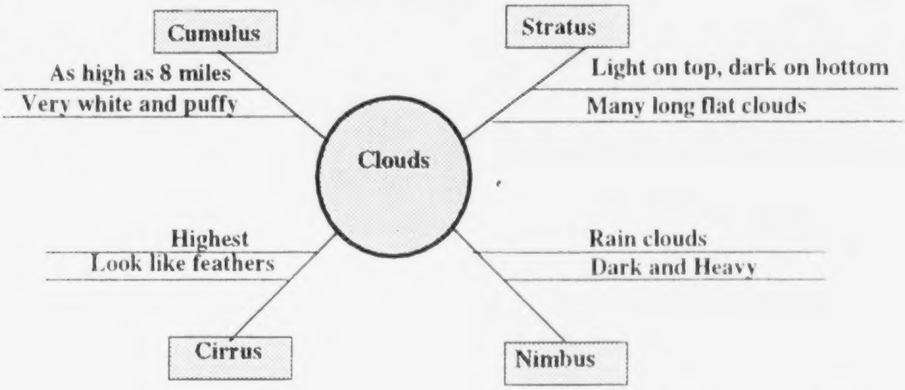
In semantic mapping, circles and lines are used to show relationships between concepts. A semantic map could be used to learn vocabulary words or to activate prior knowledge in brainstorming.

Semantic Map



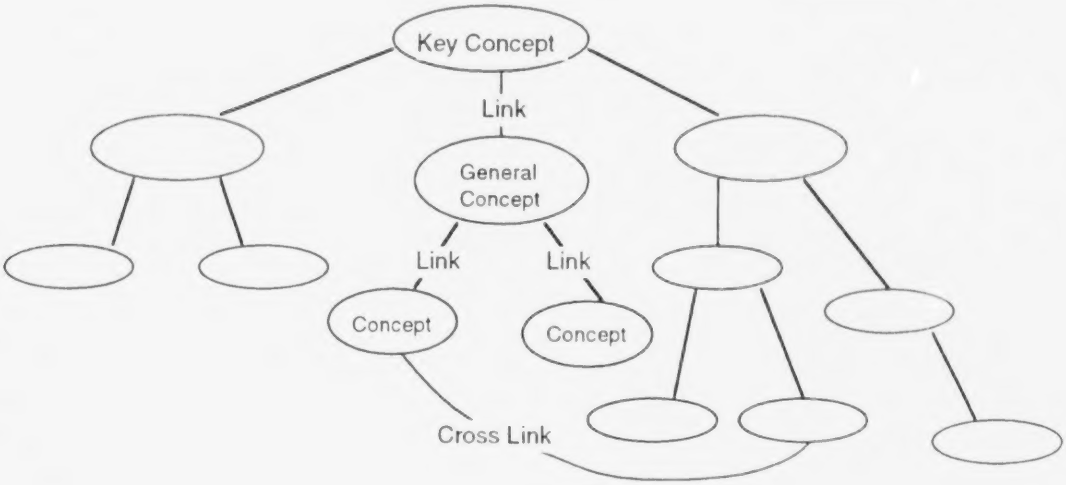
A spider map is used with a main theme or concept at its center and related themes branching from the core.

Spider Map


Cumulus
As high as 8 miles
Very white and puffy
Stratus
Light on top, dark on bottom
Many long flat clouds
Clouds
Highest
Look like feathers
Cirrus
Rain clouds
Dark and Heavy
Nimbus

Concept maps link concepts and propositions hierarchically. The broader, general concepts are placed at the top and the more specific concepts below. Concepts build on one another and are connected to identify the relationship.

Concept Map

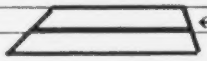

Key Concept
Link
General Concept
Link
Link
Concept
Concept
Cross Link

Notetaking

Notetaking has been shown to facilitate memory of the most important ideas if it entails processing a way that is compatible with the task students will eventually perform. To take good notes, one must separate the major points from the minor ones and consider the relationship between ideas.

One system, which has resulted from decades of research and is widely used, is the Cornell Notetaking Method. The notes, ideas, facts, or important information are written on the right side. In the left column a few key words are written that help students remember what is on the right side.

Cornell Notetaking System

Key Words	**Notes**
Special Trapezoid (isosceles)	*Isosceles trapezoids have two congruent sides.*
	Base angles are congruent.
	Opposite and consecutive angles are supplementary.
median of trapezoid	 ← *median*

Storyboards

A storyboard provides a visual means for conceptualizing and organizing information in a scenario. It is a template for depicting action to show a sequence of events for a story or a procedure. Methods used for teaching children techniques of storyboarding include using advertising photographs and comic strips from Sunday newspaper supplements. Students learning storyboarding study elements such as perspective, lighting, texture, composition, and lines. To help students interpret stories, teachers can ask students questions such as

- Does the story line make sense?
- Might the visuals have been sequenced differently? If so, how?
- Are more visuals needed for the story board's story line? Explain.

In video production, students add audio effects to the storyboard design. For elementary mathematics, students write or interpret story problems using manipulatives such as toy animals or cartoon characters in a dimensional scenario on a storyboard. A sample scenario for addition could include a picture or drawing of a swimming "pool" with manipulatives representing ducks. The teacher would pose a series of problems for primary students, while moving the manipulatives around on the storyboard. An example follows:

"Donald Duck decided to go swimming in his pool. Daisy brought 3 of her friends to the pool. How many ducks are in the pool now? Then Donald's nephews jumped in and splashed one of Daisy's friends, so she got out of the pool. How many ducks are in the pool now? Donald got out to get her a towel..."

Story Maps

Story maps identify literary elements such as main characters, setting, problem, major events, problem solution, and a theme for a story. Before completing the story map, students should first listen to or read the entire story or the portion of a book which has been assigned.

TITLE: Molly's Pilgrim

SETTING: Home and School

CHARACTERS: Molly

Elizabeth

Mama

Miss Stickley

PROBLEM: The other children laugh at and make fun of Molly.

EVENT 1 The children tease Molly

EVENT 2 The class has to make Pilgrim clothespin dolls.

EVENT 3 Mama makes Molly's doll look like herself.

EVENT 4 The children laugh at Molly's doll because it doesn't look like a Pilgrim

EVENT 5 The teacher tells about modern Pilgrims and the Jewish holiday that inspired Thanksgiving

SOLUTION The children understand about Molly and decide to be friends with her

VI. Problem Solving

A. Process

Brainstorming
Discussion
Heuristics
Inquiry/Investigation/ Experimentation
Questioning

Problem solving is often seen only as an end, a goal, or a product rather than as a strategy for learning. Indeed, problem solving is an academic expectation in Goal 5: Think and Solve Problems; however, as a strategy, problem solving takes the form of both process and product. Students solve problems to learn related concepts such as sampling, critical thinking, predicting, historical perspective, and cause and effect. For example, many concepts are involved in a problem which requires students to determine the inventory needed for the school bookstore or to examine a court case to determine the applicable laws.

Brainstorming

Brainstorming can be used to solve problems by eliciting multiple ideas from students in a short amount of time. Teachers should

- create a relaxed, informal atmosphere;
- state or write the problem;
- set a time limit; and
- assign a recorder.

Students contribute ideas which are recorded for all to see. No judgments are expressed by either students or teacher. After ideas are exhausted, students

- critically examine and eliminate duplicates or unreasonable responses;
- prioritize remaining suggestions; and
- solve the problem, if possible.

Brainstorming can be used to stimulate creative thought, involve all students, and practice communication skills.

Discussion

Discussion should be used consistently to encourage students to use dialogue as a tool for thinking and understanding. Teachers should ask questions which allow them to explore, brainstorm, and react. This permits students to control and become "owners" of the ideas.

To promote discussion, teachers can

- allow students to talk without raising their hands,
- encourage students to listen carefully to student speakers,
- provide wait time,
- ask speakers to summarize comments of the previous speaker, and
- avoid repeating student comments.

Heuristics

A set of heuristics, sometimes defined as conscious mental procedures, have been identified for solving problems.

To make a problem smaller, easier and more manageable students can

- look for a pattern,
- account for all possibilities, or
- construct a table.

To solve more complex problems students can

- work backwards,
- act out the problem,
- make a drawing or diagram,
- employ trial and error (in mathematics, guess and check),
- make a model,
- restate in their own words, or
- break into smaller pieces.

More skillful problem solvers can

- identify subgoals,
- change their points of view,
- solve a simpler or similar problem, or
- check for hidden assumptions or mistaken inferences they may have drawn.

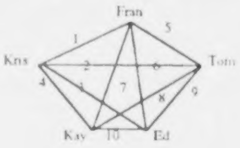
In addition to these, there are procedures traditionally associated with mathematics problems, such as

- selecting appropriate notation,
- identifying wanted, given and needed information, or
- writing an open sentence.

An example for solving a problem by selecting appropriate notation follows:

At the first meeting of the Chess Club, the five members decided that everyone in the club should play everyone else one time to determine the two best players for interschool competitions. How many games had to be played?

Appropriate notation
5 dots represent 5 people
Games played shown by line segment •——— •



Inquiry/Investigation/Experimentation

In inquiry training, students are presented with a puzzling event. They observe and gather data about the event; verify and conduct an experiment (try out a hypothesis and test relationships); organize information obtained during the data gathering; and formulate an explanation. The problem-solving strategies are analyzed, necessary revisions are made, and the process is repeated, if necessary. Generally, experiments are more formal types of investigations. The inquiry training model is outlined below:

In inquiry training, students should be able to

- **Formulate usable questions**
  - generate a number of possible questions
  - recognize which questions are in the domain of scientific inquiry
  - be aware of the complexity of the questions being generated
- **Plan experiments**
  - select a question that can be explored through experimental procedures
  - design a procedure for systematic collection of data
  - choose appropriate measuring tools
- **Conduct systematic observations**
  - choose and/or design and build tools and apparatus
  - use tools and apparatus
  - collect and record data, judge precision, and accuracy
  - organize and represent data
- **Interpret and analyze data**
  - graph data
  - retrieve, use, compare data from other investigations
- **Draw conclusions**
  - relate conclusions to data and their analysis
  - relate their investigation to other experiments
  - relate their experiment to models and theories
  - suggest further investigations (formulate new questions)
- **Communicate**
  - use words, graphs, pictures, charts, and diagrams to describe the results of their investigations
  - produce summaries or abstracts of their work
  - use technology to improve communication
  - analyze critically other people's work
- **Coordinate and implement a full investigation**
  - formulate questions
  - plan experiments
  - conduct systematic observations
  - interpret and analyze data
  - draw conclusions and communicate the entire process

Questioning

Research on Bloom's Taxonomy has concluded that teachers who use higher-order questions during instruction promote learning by asking questions at the application, analysis, synthesis, and evaluation levels. They require students to engage in more sophisticated thinking. Sample questions follow:

- How are the two main characters alike and different?
- What do you think is the editor's stand on gun control?
- What are the pros and cons of extending the number of days in the school year?
- What might happen if gasoline prices are increased?
- How is an argument like an exothermic reaction?
- How might we confirm that these figures are duplicates?

Over 2000 years ago, the Greek philosopher Socrates demonstrated the power of questioning to stimulate thinking—the "Socratic method." It involves conducting an argument or imparting information by means of question and answer. Critical thinking, divergent interpretation, and reflection are important to the process. The way a teacher structures a question influences the nature of the thinking required to respond. Discussion strategies, such as asking for elaboration, influence the degree and quality of classroom discussion.

Probing questions that press students to consider and weigh diverse evidence, to examine the validity of their own deductions and inductions, and to consider opposing points of view contribute to a classroom climate of inquiry and thoughtful examination of ideas. Students who are regularly exposed to questions that require them to defend their responses with reasons and evidence may internalize this "critical thinking" habit.

Wait Time

The time which is allowed to elapse after a teacher question is referred to as Wait Time I, and time after a student response as Wait Time II. Results of analysis of 300 classroom tape recordings by Mary Budd Rowe in 1974 showed a mean Wait Time I of 1 second and a mean Wait Time II of .9 seconds. Later studies indicated that when teachers waited 3-5 seconds after asking a question and after hearing the answer, the following occurred:

- student responses grew from three to seven times longer and contained more explanation and elaboration;
- students supported more of their inferences with evidence and logical arguments;
- students asked more questions, proposed more experiments, and increased speculative thinking;
- students competed less for the teacher's attention and listened more to one another;
- fewer students responded with an "I don't know" answer;
- discipline problems decreased and more students participated and volunteered;
- students appeared more confident and phrased fewer of their responses as questions; and
- achievement improved on written assessments requiring complex thinking and problem solving.

VI. Problem Solving

B. Product

Case Studies
Creative Problem Solving/
Future Problem Solving
Debate
Formulating Models
Interviews/Surveys/Polls
Oral History
Research
Role-play
Simulations

As discussed previously, problem solving can be considered as both process and product. The use of certain problem-solving strategies results in specific products–inventions, models, or presentations.

Case Studies

A case study refers to an intensive investigation about a person, group, institution, or community. It is constructed around experiences, events, or interrelationships to form a comprehensive, integrated picture. For example, in order to understand why young people join gangs, an investigator could study case studies of particular gang members which provide details of the persons' childhood, home life, school and work experiences, and personality traits.

Students can learn to analyze and research other questions through the use of case studies. Students can use reasoning, decision-making, and reflecting skills to make generalizations about the data and suggest possible solutions or appropriate alternatives. They can also make predictions for the future.

Creative/Future Problem Solving

Creative or future problem solving results in products such as artistic **composition** or **inventions**. To prepare students to creatively solve problems, they should participate in activities such as:

- mind stretchers which encourage them to
  –think divergently
  –think beyond constraining boundaries
  –make new connections
  –view difficult situations in unusual ways
- brainstorming and force fitting
- discussing and evaluating projects, problems, and topics in groups.

Teachers should encourage students as they look for alternative solutions, make intuitive leaps, and eliminate nonproductive or less productive ways of solving problems. The idea illustrated below helps students begin to think divergently:

> *Teacher says:*
>
> *"I have behind my back an object that I found (an unfamiliar object like an unusual kitchen utensil or an item from the garage or attic). I want to know what you think it might be. The first person that I hand it to will have one minute to pass it silently around the group. At the end of that minute, I will say, 'Begin.' Whoever has the object in hand will give a response and pass the object on to the next person for a response. We will stop at the end of two minutes. You may begin the one minute silent thinking."*

"I invent nothing, I rediscover." **Auguste Rodin**

Invention is the process of creating something new to meet a perceived need. As opposed to solving a problem in which an outside constraint or limiting condition must be overcome, invention involves standards or criteria which are set by the inventor. For example, while a group of students are inventing a better procedure for their class to use in going to recess, they might decide that they want the new approach to be quieter and quicker than the one currently in use. Those are the standards they have imposed, which may or may not be accomplished.

Inventing also involves a revise and refine phase. For example, if a student is asked to build a bridge that is as strong as possible, a standard will relate to the strength of the bridge. The model would be revised to assure it meets the standard as completely as possible.

A logical beginning point for the study of invention and innovation is the clarification of terminology. Ask students to define invention, imagination, evolution, engineering, discovery, and creativity. It is important that students share a common understanding of these terms and their subtle, semantic differences.

The most widely used CPS (Creative Problem Solving) model of inventing was created by Isaksen and Treffinger (1985). The stages follow:

- Mess-Finding—recognize that there is a problem and accept the challenge to attempt solutions.
- Data-Finding—determine the need for the invention, the cost, and the existence of other patents.
- Problem-Finding—select the key problem.
- Idea-Finding—look for ways to combine and alter the known world.
- Solution-Finding—compare the most promising ideas generated in the previous step and apply selection criteria like cost, feasibility, ethics, or environmental impact.
- Acceptance-Finding—physically invent and implement the best solutions

General Steps for the Invention Process

Choice	Identify a situation requiring improvement or response.	State the purpose or goal; write or say it from different perspectives.
Rehearsal	Identify specific standards for the invention.	Make a model, sketch, or outline of the invention.
Drafting	Start developing the product; keep looking for alternatives for creating the product.	Occasionally, set aside your product to allow for reflection.
Revising	Continue revising the invention with attention to detail.	Stop when a level of completeness has been reached consistent with the established standards.

Some ideas for inventions include:

- a map showing economics, terrain, and politics of a region;
- improvement on the periodic table;
- a new way to divide;
- something that will conserve water on the moon;
- design of a "wheelchair friendly" kitchen;
- an improved version of an animal;
- a more effective reading lamp; and
- an organizer for clothing.

Debate

Debates encourage people to examine reasonable arguments on each side of a significant issue in order to make a reasoned decision about a complex issue. A formal debate has a structured format where two positions on a controversial issue are presented in a specific format. Each debater is given a certain amount of time to state a position, respond to questions from others, and pose questions.

Debate requires that every claim be supported by evidence and be answered by opponents, who also present evidence to support their beliefs. Evidence is limited to facts, statistics, examples, and the opinions of experts. Preparation requires critical thinking and forces students to reason through problems or issues.

A debate usually centers on a proposition which contains suggestions for a change in an action or decision. A proposition may also be a set of rules or may refer to a particular plan. If teams are selected for debate, the team that argues for the proposition is called the affirmative team, and the team that argues against the proposition is called the negative team.

General steps for a debate are

- select topic,
- state proposition,
- list arguments and choose strongest,
- predict opponent's arguments,
- research and prepare evidence,
- prepare summary statement, and
- conduct debate.

Formulating Models

Models are representations of things, abstract ideas, or relationships. They can be used to study something too large to see in its entirety (such as the solar system), or too heavy (such as an airplane), or too small or delicate (such as a molecule or an eye). As manipulatives, they can be used to help students visualize 3-dimensional figures represented in a textbook. As computer-generated simulations, they can help students identify aspects of the object or idea they represent.

Models can be

- physical such as maps, blueprints, sculptures, or mathematics and science manipulatives;
- mathematical such as equations, graphs, proportions;
- conceptual or mental such as analogies, metaphors, graphic organizers; and
- theoretical such as a set of rules or laws that represent an object or event such as predicting election results or the future growth patterns of a forest.

Interviews/Surveys/Polls

No single method for obtaining data is appropriate for solving every problem. The scope and nature of the problem dictates the most appropriate form to be used. An unwieldy problem can be tackled by sampling, while interviews are preferred for gathering data when personal interaction is preferred. An interviewer can observe facial and body expressions, hear incidental comments and tone of voice, and probe more deeply into a problem.

Whichever sampling tool is used, it must be bias-free. The information gathered must be representative of the entire population sampled and allow for logical inferences to be drawn.

Oral History

Oral history centers around the process of interviewing individuals, called narrators, to obtain historical information. The narrators can include family or community members who can provide insights into the identified topic. The student questions the narrators about family traditions; length of time in the community; specific contributions in a particular field; or knowledge about an institution, event, or process. The content of the interviews are recorded in the form of notes, videotapes, or audiotapes for later use.

Learning experiences include interviewing, transcribing, researching, and writing oral history articles. Students apply and extend thinking and communication skills, thus learning to use the tools of the trained worker. They engage in concrete and abstract reasoning as they move from fact to divergent questioning during the interview process.

Many times narrators convey a sense of the past through specific images and anecdotes. Through questioning, the oral historian preserves narrative history through time and generations.

Research

In an informal sense, research can mean a "search" for information about a topic which is of interest. However, the discussion here will relate to research used in solving problems.

Identifying and analyzing a problem is a prerequisite for conducting a research study. To form the problem statement, students should

- accumulate data and information that might be related to the problem;
- determine which data or information is relevant;
- propose explanations for the cause of the problem; and
- question assumptions made.

Then, they need to determine

- the necessary background knowledge and skills needed to study the problem;
- the tools, equipment, and resource people necessary to conduct the investigation; and
- the practical value of the findings.

To solve the problem, students formulate a hypothesis or construct an argument which must be confirmed or refuted by data. To test the hypothesis or argument, students must deduce its consequences, develop experiments to determine whether the consequences actually occur, and carry out the experiments. The results of the experiments must be analyzed and compared to the hypothesis.

Role-play

Role-play allows students the opportunity to portray real-world situations. This requires students to use reasoning and problem solving to deal with the reality of the experience as it unfolds.

Uses and purposes of role-play include:

- developing skills in interpersonal communication and problem solving,
- promoting understanding of others,
- explaining to real-life situations, and
- creating insight into the motives of others.

During role-play, the teacher should accept responses in a nonevaluative manner and help students explore various sides and compare alternative solutions. Students should reflect, paraphrase, and summarize responses.

Simulations

A simulation is a representation of a real event in a reduced and compressed form that is dynamic, safe, and efficient. Students participating in a simulation become active participants in the learning process and receive immediate feedback. Simulations can be brief, simple activities or month-long, complex re-creations. Teachers may need to construct or improvise unavailable materials or settings, such as those for a simulation of a shuttle mission, a bank where students can make deposits or secure loans, or an 18th century scenario where students can make soap, build cabins, or cook outdoors. Many excellent simulations and games are available commercially for use in the classrooms or on computers.

Through simulations, students can learn about competitive business, community cooperation, empathy, the social system, scientific concepts, technical skills, the role of chance, and the ability to think critically and make decisions. Monte Carlo and mock trials are examples of simulations which are used in the classrooms.

Monte Carlo

Monte Carlo simulation uses random number generators such as dice or spinners to solve problems of probability. A classic example of the Monte Carlo defines a problem. For example, there are several different prizes in cereal boxes. Determine how many boxes of cereal must be bought to get a complete set of prizes. If there are ten different prizes, numbers are generated (with dice, a computer, etc.) until all ten appear at least once. The simulation is done by several students, and the class average determines the best estimate of the number of cereal boxes that must be bought before all prizes are acquired.

Mock Trials

Mock trial simulations put on trial someone or something such as historical figures, nations, or concepts. Students play the roles of attorneys, witnesses, judge, and jurors. They prepare and present the case after studying trial procedures.

VII. Technology/Tools

Adaptive Devices
Calculators
Computer Utility
Data Collection Tools
Design
Distance Learning
Games
Interactive Video
Manipulatives
Multimedia
Puppets
Telecommunications
Video/Audio Production/Videotaping

Electronic technology and other teaching, learning, and management tools enable teachers and students to access, organize, interpret, connect, and express information and ideas more quickly, more effectively, and in ways previously unavailable.

The terms "technology" and "tool" have many connotations, depending upon the context in which they are used. Within this section, the following operational definitions are assumed:

> **A tool is any object or device used to increase the efficiency, effectiveness, or productivity of what teachers and students do.**
>
> **Technology refers to tools that are electronic in nature.**

Teachers and students use a variety of tools. **Manipulatives**, such as magnets, terraria, geoboards, and pattern blocks allow students to interact directly with phenomena, and get hands-on experience that enables concept-building. It is critical that students engage in interpretive discussions constructing meaning of concepts from their direct experiences in using manipulatives. For more details on the use of manipulatives, see the Instructional Resources section of this framework. **Games, puppets**, and similar tools engage students in simulating real situations or imagining new ones.

The use of technology by students is a critical factor in the educational vision which views the student as an active information worker, rather than as a passive information receptacle. **Adaptive devices** enable students with disabilities to take advantage of their educational environment in ways that were never before imagined; **CD ROM** and **telecommunications** link students to the most current sources of information, regardless of their particular geographic location; **spreadsheets, calculators,** and **data collection tools** such as **laboratory probes, databases** and **videotaping** provide the capability to collect and derive meaning from large bodies of information in a timely manner; **word processing, video production, audio production, multimedia technology,** and **graphics-design software** enable teachers and students to represent information and ideas in a variety of formats.

While tools and technology are certainly not the answer to all instructional problems, they have enormous potential due to the flexibility with which they allow people to work with information and ideas. The human element is the key; these devices are only as powerful and creative as the human mind which directs them. Helping students develop appropriate ways to harness the power of tools and technology is the goal for which teachers and administrators should strive.

The use of one type of technology or tool not only overlaps with the use of another, but also facilitates teaching many other strategies and academic expectations. Therefore the information presented in this strategy component is compiled in a different format than in the preceding sections. All examples and descriptions are contained in scenarios so that teachers can see how the tools are used in a real situation. They are intended to illustrate just a few of the ways that technology can help students achieve the goals set for them. They are composite descriptions, not meant to represent a specific teacher or school. However, the technology described is available today and is already in use by creative, innovative Kentucky teachers. By their nature, the learning situations described touch on a wide variety of the academic expectations.

"Technology For the Birds"

Today is the big day for the students in Ms. Morgan's fifth grade class. For the past three weeks, they have been making careful observations of the kinds of birds visiting the birdfeeders they built and placed around the school grounds. Learning how to identify the birds wasn't easy: they practiced by using pictures from a **CD ROM** disc and a classification key sent by a naturalist with whom they corresponded via **electronic mail**. During these three weeks, they carefully recorded their daily observations in a **spreadsheet** from which they could rapidly summarize and graph their data. Deciding on the best kind of graph to use was a challenge, since each kind of graph let them visualize their information in a different way.

At the same time that Ms. Morgan's class has been gathering data, fifth grade students at nine other schools across Kentucky have been doing the same thing. The classes have been corresponding with each other all along; they are all part of the same huge project. At last the time has come for the classes to share the information they have compiled. Using an **electronic bulletin board**, each class sends its findings to the others. Now each class has data from across the state. They compare bird sightings from the various regions and build a composite picture of bird distributions based on their data. **Drawing software** provides a way for them to illustrate their findings on a Kentucky map.

How does their statewide data compare with other information about bird distribution in Kentucky? Using their **electronic information-searching** capabilities, they find just what they need at the Kentucky Nature Preserves Commission – a database of Kentucky animal species, their habitats, and sighting information. They use this information to construct a second map showing habitat regions of the state and areas of expected occurrence of the bird species. This new map leads to several discussions, including: Why do different birds prefer different habitats? Have the habitats changed over the years? What role have people played in the changing habitats?

Finally, Ms. Morgan's class compares the two maps they constructed. They propose explanations for differences. During a live "debriefing" telecast via **interactive video**, they discuss their findings with a scientist who helps them interpret what they have done and answers questions from students at the participating schools. Working in small groups, they prepare a written report of their research, illustrating their findings with the graphs and maps generated.

"It's All in How You Look at It"

Mr. Platt's physics class is working on its final exam. But it's not the kind of final that used to be given, with students responding to page after page of questions and problems that the teacher has constructed. Instead, Mr. Platt's students have been assigned to construct and present a **multimedia** representation of several fundamental ideas of physics. Throughout the school year, the students have had ample opportunity to polish their multimedia skills, both in Mr. Platt's class and in their other classes. Thus, they take to the assignment with confidence and enthusiasm.

The results of the students' efforts are as varied as the students themselves. Richard uses **animation**

software to create pictorial sequences illustrating velocity, acceleration, force, and momentum. He even incorporates **audio samples** of sound effects to make the visual effects more appealing. Holly, on the other hand, looks for more "practical" examples. Combining images from a **video disc** with **videotape** she shot herself, she builds her presentation around amusement park rides as examples of physics principles. Abstract concepts such as inertia, torque, and gravitational acceleration take on a visceral meaning as she relates the concepts to the physical experience of the rides. James takes an altogether different approach, deciding to look for evidence of physics in the world of the arts. Slides from a Metropolitan Museum of Art **video disc** provide images to illustrate kinetic and potential energy, reflection and refraction of light, and frames of reference. A **video clip** from the movie, "Who Framed Roger Rabbit" provides the context for distinguishing between vector and scalar quantities. Working in a similar vein, Janet uses science fiction as an organizing theme for her project. Text passages from Issac Asimov, Arthur C. Clarke, and Frank Herbert are analyzed for the science underlying the fiction with **digitized speech** accompanying the text display. Audio and video clips from motion pictures and television provide further examples and non-examples of physics concepts. Her presentation ends with a segment demonstrating links between the science fiction of previous decades and the scientific achievements of today. Coming from yet another direction, Pat traces the parallel between understanding physical principles and the development of technology and culture from the 1600's to the present. Using **video clips, scanned photographs,** and **computer graphics**, Pat highlights thermodynamics, electricity, and planetary motion as topics to illustrate the impact of scientific knowledge on social organization and industrial development, and the impact of cultural beliefs on the direction and development of scientific thought.

The students present their products to Mr. Platt and the rest of the class, providing additional information and elaboration in response to questions. Each student has used multimedia tools to express his or her personal interpretation of what physics means. Mr. Platt can use their presentations to evaluate how deeply they can connect physics to the world around them.

"Everyone's a Critic"

The schools participating in the "Authors' Network" have placed their students' writing efforts in a new context. Besides using **word processors** to write, revise, and print their work, the students also use technology in the critiquing process. As persuasive essays, stories, narrative reports, or other written products are composed, they are shared via **modem** with student "writing partners" in the other schools. These partners react to the writing, sharing both complements and criticisms with the author in a non-threatening manner. Of course, the authors work hard on their first drafts wanting the work that is read to be of good quality. The partners benefit, too, as their critiquing skills become transferred to analyzing their own writing.

The **Network** serves as a testing ground for many novel ideas. When one school's students wrote reports and opinion articles about the homeless in their town for submission to the local newspaper, their Network partners served as proxies for community readers, checking for clarity of communication of the issues. Another school's students submitted manuscripts for a set of stories to produce for students at the local elementary school. For practice in explanatory writing, another school gave students the task of preparing orientation handbooks for new students. Several schools established pen-pal programs to encourage writing for informal communication.

The Author's Network is not just for language arts classes. Social studies classes exchange student writing about social, historical, economic, or cultural questions. Foreign language students polish their skills by composing letters or reports in their new language to be read by international partners for whom it is the native tongue. School newspaper staffs share articles and editorials. The Network has students thinking about writing and reading in a whole new way.

"Math Explorers"

Ms. Blackwell's eighth grade Algebra class is studying functions. Ordinarily this would consist of computation, followed by plotting the graphs of the functions. But since she is satisfied that her students' computation and graphing skills are reasonably mastered, Ms. Blackwell uses technology to eliminate some of the drudgery. Her students use graphing calculators to produce function graphs quickly and accurately. Today they are exploring functions with the form y=mx + b.

Working in groups, the students generate graphs of a given series of functions. They begin to notice some regularities. Each of the functions is a straight line; as the "b" value changes, the line moves up or down on the graph; as the "m" value changes, the line gets steeper or flatter. The more functions they test, the more certain they become about the patterns they have found. They predict the equation of a function that would produce a given graph, then test their prediction and make revisions. All along, the students are writing about what they are doing and what they are finding out. New terms that are introduced, such as "slope", "intercept", and "linear function" make sense because the students have first-hand experience with what they are and how they can change.

"City Planners"

Tenth graders at Anytown High are engaged in an interdisciplinary study of growth and change. Activities up to now have included investigating the growth rates and patterns of bacteria, including the effects of crowding; examining economic principles of supply and demand by case studies; and using census data to track and interpret population shifts. Technology, especially spreadsheet and **database** applications, has been used to store and organize information so that patterns and relationships might be explored.

Today, they will begin to use **computer modeling software** to investigate the influence of zoning on the growth of cities. The discussions heard in the classroom are remarkably similar to those that would arise in planning a scientific experiment – identifying and controlling variables, formulating hypotheses, planning trials. Working in groups, the students decide on the features of two cities, identical in every respect except for the zoning patterns. They follow the computer simulation as it models the development of the cities over time, making note of the changes that occur. At the end of the simulation period, they analyze the two cities, looking for similarities and differences. Why did this area develop into slums, while this one prospered? What kinds of businesses developed? What areas had pollution problems? The groups can decide to adjust certain variables and run the simulations again, testing their hypotheses about what will happen. In the end, each group will prepare an oral presentation, including visual aids, to share their findings with the other students.

The results and insights gained from the simulations will next be applied to their own city. What effects have local zoning policies had on the growth and development of their hometown? What changes in zoning might be necessary to improve the economically-depressed areas of the city? **Video** and **audio** recordings will be made of interviews with town officials, city planning experts, and ordinary citizens to get their views and recommendations to add to the discussions.

"Happy Trails"

Students in Ms. Adelman's sixth grade social studies class are learning first-hand about the rigors of pioneer life. They are participating in a **computer-simulated** wagon train journey across the early West. Each computer station in their networked lab is a wagon in the train. Groups of students work together at each station. Each student is a different character in the simulation, representing the range of individuals who might have traveled on a real wagon train. Each group discusses how to use their money to stock their wagon with food, water, ammunition, personal belongings, and other items. Group consensus is an important factor in reaching decisions.

As the wagons proceed on the trail, students communicate with each other via their **computers**. They follow their progress on computer-generated maps making decisions about when to stop to hunt for food or water. The wagon groups must consult with each other to decide how to respond to incidents that occur along the way – illness, accidents, bad weather, criminal acts, etc.

Can the students work together to make the decisions that will take them safely to their new homes in the West? That is the challenge they face. Of course, the simulation may be run as many times as the students need, in order to learn the problem-solving and decision-making skills they need to help the group reach its goal. Each trip is different and presents a new set of challenges to the student pioneers.

Ms. Adelman helps the students understand the historical context in which they are working and encourages them to act in accordance with their roles. She also helps them discuss issues that arise and analyze the consequences of decisions that are made. She observes the students throughout the simulation. She looks for evidence of historical understanding, communication skills, and group process skills.

"You Make the Arrangements"

Ever since they began learning to play their instruments, the students in Mr. Taylor's high school band have used music composed and arranged by someone else. Their focus has been on accurate performance of their given parts. Mr. Taylor has decided that it's time for them to experience another side of music – the process of exploring musical communication and putting musical elements together in a way that expresses ideas and emotions.

Personal computers, connected to **electronic synthesizers** via a **MIDI interface**, provide the musical sketchpads that Mr. Taylor's students use. They start with a piece of music that they have already performed. By altering tempo and key signature, eliminating parts, and assigning parts to different instruments, the students experiment with the music. The synthesizer allows them to hear the results of their manipulations immediately without the whole band having to try the new version. Listening through headphones, they compare the new music's effects with how it sounded previously. Because the technology is networked like a language lab, Mr. Taylor can observe and listen to what each student is doing. He can even bring students together to listen to each others' experiments. As they explore, the students begin to realize the contributions of such factors as key signature, tempo, meter, rhythm, register, voicing, and instrument blend to the overall effect of music on the listener.

Next, the students are given a specific task – alter the arrangement of a given piece of music to change its effect from gaiety to sadness. Working in groups, the students manipulate the elements of the piece, slowing its tempo, changing to a minor key, assigning parts to different instruments. The synthesizers play the results of their work, and the groups compare the different approaches they took. **Notation software** allows the groups to print a high-quality copy of their arrangement to place in their music portfolios.

Those students who wish are now given the opportunity to experiment with composition, putting together melody, rhythm, and harmony elements in an original manner. The flexibility of the computer/synthesizer combination means that they can "play" and hear parts for instruments that they cannot physically play themselves. They experiment with their song and its arrangement until it is ready to be played for the other students. Again, they print copies of the transcriptions for their portfolios.

The technology can assist in honing students' performance skills as well. By playing their part on an appropriate MIDI instrument, the performance data is recorded by the computer. A transcription of what they played can then be compared to the original piece, looking for timing or note errors. Mr. Taylor can compose exercises for individual students needing to work on particular skills.

Thanks to MIDI technology, music in Mr. Taylor's class is truly a creative experience.

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VIII. Whole Language Approach

Although Whole Language consists of several discrete strategies, it is described here as one intact component, one philosophy, in which all parts must be interwoven and integrated to achieve the goal.

The term "whole language" is difficult to define because of the wide diversity of practices which have been placed under this broad label. However, the perimeters of the term can be more easily drawn if the whole language approach is described as a philosophy as opposed to methodology.

The whole language philosophy is based on a theory about how people learn and think. The processess involved in learning and thinking are social and constructive in nature, involve experimentation in a risk-free environment, necessitate relating newly learned materials to previously gained knowledge, and are more successful when learners are actively engaged in them.

According to whole language proponents, children should use language in ways that relate to their lives and cultures. In many cases, the final answer (product) is no more important than the process of learning to define and solve problems which are academic expectations in the Kentucky Education Reform Act.

Skills are the means to an end and are practiced in the context of any given opportunity. Mere memorization of facts becomes less important than creative thinking and the application of those facts in performance situations. Stress is placed on language being kept whole and uncontrived.

Within this philosophical framework, children are trusted to learn in student-centered, print-filled classrooms, where learning is enjoyable and materials have meaning and relevance to their lives. Teachers are viewed as resources, coaches, and co-learners, allowing children to make choices and share in decision making. Student interest and intrinsic motivation rather than external rewards and teacher control promote learning. Questions are asked to generate discussion rather than to provide answers. Collaboration with peers is encouraged as students become fellow learners in the pursuit of a subject. In this way, whole language teaches skills and processes that create "literate people" able to function in various types of communication-based situations.

The focus of assessment shifts to match the type of learning in the whole language classroom. The format becomes more open-ended and less formal. Teacher observations and frequent progress notes become key to evaluation of classroom performance. Students monitor and self-evaluate their own procedures and expectations and set personal goals for improvement. Holistic assessments of finished products treat both reading and writing projects as a whole. Ability to "make-meaning" is understood to be both process and product-oriented in this type of assessment.

Advantages of a Whole Language Program

The advantages to such a literature-based curriculum relates to KERA's academic expectations. "Integration of knowledge" is advocated. Because authentic reading tasks are provided in print-rich environments, students learn to monitor and assess their own reading skills through the act of reading. Rather than being limited to reading class, reading skills become personal tools to promote independent learning in other classes. The elements of reading and writing are viewed as integrated processes and are integrated into all disciplines rather than being isolated within the language arts curriculum. As students become aware of the processes used to gain knowledge through reading, they are able to adapt to differing reading tasks faced daily across the curriculum. Practice with real, rather than contrived reading tasks, helps students make the transition to "self-sufficiency," and independent reading. Transfer of these basic skills and concepts to tasks beyond school occur more readily because the learner sees the value of accomplishments. Success comes because students learn by participating in activities that they have found meaningful. Ownership of knowledge is theirs and may be shared with peers in other problem-solving situations.

Key Elements in the Whole Language Approach

1. **Print-rich environment with flexible seating that encourages reading and writing.**
   The physical layout of the classroom supports the whole language philosophy of learning and teaching. There should be print everywhere and space for exploration and shared learning. (See Morrow reference and Routman's *Invitations*, Chapter 15).
2. **Shared reading, the use of Big Books and the reading aloud of real literature.**
   Observation by students of an expert modeling fluent, expressive reading in a relaxed environment focuses on books for pleasure. Students are encouraged to read along and follow the oral experience with personal rereadings. When Big Books are used, smaller versions are made available to students. (See Peetoom reference).
3. **Guided Reading.**
   The teacher supports children in thinking and questioning their way through a book. Students meet with the instructor to think critically about the material. This may be done with whole class, small groups, or individualized. (See Routman's, *Invitations*, Chapter 3).
4. **Independent reading.**
   Sustained silent reading for which all types of materials are provided. Students take care of their own reading by choosing and reading books. The teacher provides time, promotes ownership, and makes observations in order to give appropriate response. (See Routman's, *Invitations*, Chapter 3).
5. **Interdisciplinary, thematic units that integrate subject-matter, skill usage, and interest levels.**
   Content units focus on major concepts. Reading, writing, speaking, and listening become interrelated to facilitate student learning of those concepts. Literature becomes the vehicle to teach language arts across the curriculum. (See Pappas, et al. reference, Chapters 3 and 8).
6. **Reading/writing connections made through written and oral activities.**
   Since reading and writing involve similar processes to construct meaning, many skills can be learned and extended through their interrelatedness. Successful writers integrate reading into their writing experience, and successful readers integrate writing into their reading experience. (See Calkins reference).
7. **Response logs and journal writing.**
   Used to record student reactions to literature, response logs become excellent tools for connecting reading to writing, for extending meaning of text, and for giving readers ownership of the literary experience. Journal writing provides risk-free opportunities to explore both learning and personal experiences. These types of personal writing become a means of helping students connect school and all that it is to their personal lives. (See Atwell and Calkin's references).
8. **Student published work.**
   When students are encouraged to make their work communicate ideas to an audience other than the teacher's grading pen, desire for display and publication follow naturally. Whole language rooms are characterized by student displays of all kinds. (See Atwell and Calkins's references).
9. **Student cooperation and cooperative learning.**
   Because peers are recognized as teammates rather than competitors, working together toward common goals becomes a useful instructional tool. Flexible grouping finds students working with a variety of personalities and abilities in an heterogeneous environment. (See Routman's, *Invitations*).

10. **Conferencing and shared goal setting.**
    Students and teachers become partners in the learning process. Both teacher and peer conferences help students rethink and revise oral and written projects. Out of a growing awareness of audience, students become more adapt at self-monitoring and are less threatened by the need to change the way in which the ideas have been expressed or even the ideas themselves. As students and teachers become more aware of areas of strength and weakness, instructional decisions can become more student-centered rather than curriculum-controlled. (See Atwell reference).

Myths About Whole Language

The following represent some elements NOT included in the whole language approach:

1. **An abandonment of teaching skills (e.g., spelling, grammar, and phonics).**
   Writing and reading skills are taught naturally through the context of whole literature rather than in isolation. Direct instruction and guided practice are provided as the need for a particular skill arises rather than on a preplanned curriculum or scope and sequence basis.
2. **Limited to language arts or one type of literature.**
   Whole language teachers become opportunists, seeking chances for integrating content areas with language development through a variety of materials and methods. Writing is linked to reading as a natural continuum of the constructive process of effective communication.
3. **Unplanned classroom and unprepared teachers.**
   Preparation includes long-range planning to achieve the broad academic expectations. Teachers concentrate on these to guide instruction generally, while allowing flexibility within that framework on a daily basis. Management of the varying activities and time allocations require much forethought and constant monitoring.
4. **Lack of student accountability.**
   Rather than striving to please an external monitor in the person of a teacher, students are encouraged to meet, evaluate, and change their own expectations and instructional goals. This creates self-motivated, realistic learners, able to deal with individual strengths and weaknesses for the sake of self-improvement.
5. **Limited to one age or ability group.**
   Active involvement in learning is important to the learner regardless of age and/or ability. Because the whole language environment fosters such involvement, it has been effective with all grade levels and learner types.
6. **A pre-packaged formula.**
   While many publishers have presented materials that contain components of the whole language philosophy, caution should be used in implementing them "as is". Continued observation of students and reflection on instruction are needed to assure teachers that the needs of individual learners are being met regardless of the materials selected for use.

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IX. Writing Process

The **writing process** is a tool which can be used effectively by any teacher to promote thinking and learning. At the beginning of the writing process, students must identify their purpose and audience in order to choose a form for their writing. The writing is then developed through a series of stages which usually include: prewriting, drafting, revising, editing, and publishing. A chart illustrating the process is included at the end of this section.

Using the Writing Process

The purpose for writing instruction at the **PREWRITING** stage is to enable every student to become an independent generator of ideas. To fulfill this purpose

- teachers may provide whole class instruction and practice in a variety of prewriting strategies and activities such as clustering, brainstorming, labs, field studies, observations, class discussions, etc. The student, not the teacher, will choose which strategy best suits his/her particular needs based upon the purpose of the writing and the audience.
- teachers may allow students to select their own topics and develop them in a way that is suitable to their purpose and audience.
- teachers may provide particular topic components that still leave room for some student choice and do not deprive students of either ownership of their writing or opportunities to improve their writing abilities.

Drafting sentences and connecting one thought to another usually require a deeper level of thinking than do prewriting activities. Throughout the **DRAFTING** process

- teachers should maintain a supportive environment that allows for different learning styles, provides rich resources, and gives ample drafting time in and out of class.
- teachers need to respect the writer's ability to make choices about purpose, audience, form, content, and length and to refrain from setting artificial limits or constraints upon these areas.

Writers require feedback at all stages of the writing process. During a **CONFERENCE**, the writer interacts with teachers, peers, and/or others. It is essential, however, that during these conferences the student writer retains ownership of his/her writing. While responders (e.g., teachers and peers) may ask questions and offer suggestions, the writer will decide what to incorporate and what to reject.

Responders should

- question rather than dictate,
- encourage rather than edit,
- coach rather than correct,
- guide rather than direct,
- model rather than rewrite,
- suggest rather than impose, and
- critique rather than criticize.

Another integral part of writing is **REVISION**. Revision is, in a sense, rethinking or "re-visioning" ideas. During this stage, the writer reshapes and reorders the text to match as closely as possible the new ideas in his/her head. The general guideline in revision is that the students will make decisions about what to add, delete, or change. Toward this end

- teachers should raise questions to clarify the student's purpose, approach, meaning, content, ideas, organization.
- teachers should teach students how to review their writing with each other and to talk about possible changes and should provide class time during which this exchange can take place.
- teachers/students may demonstrate sample revisions and discuss what impact they make upon the effectiveness of the writing.
- peers may read each others' writing and offer written or spoken responses and suggestions for the author to consider.
- teachers may design revision checklists for students to use with their own writing and in conferencing with peers.
- teachers should ask students to talk about their revisions and the rationale behind them.
- teachers and students should ensure that authors have the final say in the revisions they make in their writing.

The writer's goal in the **EDITING** process is to produce the best possible paper according to his/her developmental level. During this process

- teachers will emphasize the role of students as owners of their work.
- teachers will support students in self-assessing and making final editing decisions.
- students may use dictionaries, thesauri (printed and mechanical), spell checkers, or computer writing programs.
- teachers will not at any time actually do writing or make direct corrections on student work.

When a final draft of the piece has been prepared, it should be **PUBLISHED**. Various methods of publishing have been used by teachers; such as, sharing the piece with peers or parents, placing it on bulletin board, or submitting it to a contest or periodical. Publishing is a critical part of the writing process because it gives students a real purpose for their writing.

Adapted from:
Kentucky Writing Portfolio, Teacher's Handbook

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Transformations:

Resources

Instructional Material Resources

Instructional Material Resources

"Instructional materials" are defined in state administrative regulation 704 KAR 3:450 as any print, non-print, or electronic medium of instruction designed to assist students in achieving the academic expectations.

No single instructional material can ensure that all students will develop the skills, abilities, attitudes, and behaviors necessary for success. However, using a variety of instructional materials can motivate students and provide successful learning experiences. Students are often attracted to hands-on instructional materials which can be a tool for connecting abstract to concrete.

Decisions regarding the selection of instructional materials should include the following considerations:

- KERA goals and academic expectations,
- philosophy of the school/district,
- instructional goals, and
- needs of the students.

The instructional materials selected should address the multiple intelligences and various learning modalities of all students.

Instructional Materials Law

House Bill 545 allows Kentucky's schools and teachers more flexibility in the selection and purchase of instructional materials. Relevant to the adoption content area, any portion or all of a district's allocated state textbook/instructional material monies can now be spent on instructional materials for grades P-8. The types of instructional materials eligible for purchase are as follows:

- reference books
- trade books
- pamphlets
- magazines
- periodical publications for student use
- supplemental print materials
- supplemental video tapes
- globes
- cassette tapes
- slides
- recordings (that are not ancillary parts of basal programs)
- graphic materials
- transparencies
- maps
- music materials
- math and science manipulatives
- calculators
- electronic instructional materials (requires KETS approval)

The following instructional material resources section concentrates on resources that will assist teachers in transforming the learning environment.

The listing of instructional material resources ***does not indicate endorsement*** *by the Kentucky Department of Education for a particular company or agency.*

Instructional Material Resources for Arts and Humanities

Programs

Artists in Residence and Teacher Initiated Programs of the Kentucky Arts Council

Provides matching funds for working artists in the schools. For information contact: Kentucky Arts Council, 31 Fountain Place, Frankfort KY 40601 (502) 564-3757

Kentucky Institute for Arts in Education

Professional development in the arts for teachers and administrators. Two-week sessions in Louisville and Murray. For information contact: Education Director, Kentucky Center for the Arts (502) 562-0149

Regional Artists Showcases

Presented at seven sites each year by the Kentucky Center for the Arts. Artists who perform and conduct workshops in schools, make presentations, and provide information. For information contact: Education Director, Kentucky Center for the Arts (502) 562-0149

Ride to the Kentucky Center Program

Provides matching funds up to 50% to local school districts for the cost of transporting students to educational arts activities and performances at the Kentucky Center for the Arts in Louisville, Kentucky. For information contact: Division of Curriculum, Kentucky Department of Education (502) 564-2106

Publications: Books

A Guide to Arts and Cultural Education Programs and Services in Kentucky, 1992, 118pp.

A comprehensive listing of all state and local arts education resources. For information contact: Kentucky Arts Council (502) 564-3757 or, if you have a telephone line, computer and modem, access through KET-Net by calling (606) 281-9452

Building a Case for Arts Education, An Annotated Bibliography of Major Research, 1990, 69pp.

John McLaughlin, Ed.D. Published by the Kentucky Alliance for Arts Education and the Kentucky Arts Council. For information contact: Kentucky Alliance for Arts Education, P.O. Box 13280, Lexington KY 40583 (606) 254-4358

Publications: Periodicals

AATE Newsletter

American Alliance for Theatre and Education, Arizona State University, Department of Theatre, Tempe, AZ 85287-3411

Bluegrass Music News

Kentucky Music Educators Association. Hazel Carver, Editor. 1007 Granville Lane, Russellville, KY 42276 (502) 726-6427

Kentucky Art Educators Newsletter

Terry Epling, Editor. 137 Powell's Creek Road, Pikeville, KY 41501-9232

Teaching Theatre
Educational Theatre Association, 3368 Central Parkway, Cincinnati, OH 45225 (513) 559-1996

Video for Arts and Humanities

Arts and the Valued Outcomes, KET, 1992. A two-part professional development workshop entitled "Patterns" and "Cultural Heritage" for teachers on integrating the arts into the curriculum which presents activities in dance, drama, music and visual arts.

Arts Express, KET, 1989. Twenty 15-minute programs with teacher guide on music, dance, drama and visual arts for elementary and middle school.

Imagine That, KET, 1991. A 10-part series designed to stimulate creative dramatic expression in fourth and fifth graders.

Old Music for New Ears, KET, 1992. Sixteen 15-minute programs designed to present traditional music in a new light.

Professional Organizations

American Alliance for Theatre and Education (AATE)
Arizona State University, Department of Theatre, Tempe, AZ 85287-3411

American Council on the Teaching of Foreign Languages (ACTFL)
6 Executive Plaza, P.O. Box 1077, Yonkers, NY 10701-6801 (914) 963-8830 FAX (914) 963-1275

Educational Theatre Association (ETA)
3368 Central Parkway, Cincinnati, OH 45225-2392 (513) 559-1996 FAX (513) 559-0012

Getty Center for Education in the Arts
401 Wilshire Blvd., Suite 950, Santa Monica, CA 90401-1455 (310) 395-6657 FAX (310) 451-8750

Kentucky Alliance for Arts Education (KAAE)
P.O. Box 13280, Lexington, KY 40583 (606) 254-4358

Kentucky Art Educators Association (KAEA)
8308 Easton Lane, Louisville, KY 40242-2518

Kentucky Association of Health, Physical Education, Recreation, and Dance (KAHPERD)
Burch Oglesby, Executive Director. Western Kentucky University, Bowling Green, KY 42101

Kentucky Educational Speech and Drama Association, Inc.
Breckinridge Hall, Morehead State University, Morehead, KY 40351-1689 (606) 783-2712

Kentucky High School Speech League
Western Kentucky University, 135 Ivan Wilson Fine Arts Center, Bowling Green, KY 42101
(502) 745-6341

Kentucky Music Educators Association
P.O. Box 65, Calvert City, KY 42029 (502) 395-4892

Kentucky Theatre Association
Theatre Department, Northern Kentucky University, Highland Heights, KY 41076 (606) 572-5100

Music Education National Conference (MENC)
1902 Association Drive, Suite ATE, Reston, VA 22091 (703) 860-4000

National Art Education Association (NAEA)
1916 Association Drive, Reston, VA 22091 (703) 860-8000

National Clearinghouse for Bilingual Education (NCBE/TESOL)
1118 22 Street, NW, Washington, DC 20037 (202) 467-0867 FAX (202) 429-9766
National Coalition for Education in the Arts
1285 Avenue of the Americas, Third Floor, New York, NY 10019 (212) 245-4510
FAX (212) 245-4514
National Dance Association (NDA)
1010 College Avenue, Manhattan, KS 66502-2704 (913) 532-6887 FAX (913) 532-7004
Teachers of English to Speakers of Other Languages (TESOL)
1600 Cameron Street, Suite 300, Alexandria, VA 22314-2715 (703) 836-0774 FAX (703) 836 7864

Instructional Material Resources for Language Arts

Programs

Kentucky Writing Program

The Kentucky Writing Program has two goals:

1) To raise to the "proficient level" the writing ability of Kentucky students and
2) To empower Kentucky teachers and administrators through staff development initiatives to create and support learning environments where improved student writing will occur.

The following are some of the opportunities offered by the program:

- Writing Resource Teachers (available in each of the regional centers). Experienced classroom teachers offer schools and districts professional development in all avenues of writing.
- University Writing Projects. Located at seven university sites, these projects provide long-term staff development opportunities in the process of writing and the teaching of writing.
- Writers Line. In cooperation with KET-Net, this technology allows students and teachers to share "on-line" writing activities.

For information, contact:
Kentucky Writing Program, 19th Floor, Capital Plaza Tower, 500 Mero Street,
Frankfort, KY 40601 (502) 564-4394

The Kentucky Telecommunications Writing Program
Wheelwright High School, Box 1700, Wheelwright, KY 41669 (606) 452-2110 FAX (606) 452-4080

Publications: Books

Atwell, Nancie. *In the Middle: Writing, Reading, and Learning with Adolescents.* Portsmouth, NH: Heinemann Educational Books, 1987.

Calkins, Lucy McCormick, with Shelley Harwayne. *Living Between the Lines.* Portsmouth, NH: Heinemann Educational Books, 1991.

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Gillespie, John Thomas. *Best Books for Junior High Readers.* New Providence, NJ: R.R. Bowker, 1991.

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Reed, Arthea. *Comics to Classics: A Parent's Guide to Books for Teens and Preteens.* Newark, DE: International Reading Association, 1988.

Reif, Linda. *Seeking Diversity: Language Arts with Adolescents.* Portsmouth, NH: Heinemann Educational Books, 1992.

Routman, Regie. *Invitations: Changing as Teachers and Learners,* K-12. Portsmouth, NH: Heinemann Educational Books, 1991.

Routman, Regie. *Transitions.* Portsmouth, NH: Heinemann Educational Books, Inc., 1988.

Spandel, Vicki and Richard J. Stiggins. *Creating Writers: Linking Assessment and Writing Instruction.* New York, NY: Longman, 1990.

Strickland, D. and E. Morrow, eds. *Emerging Literacy: Young Children Learn to Read and Write.* Newark, DE: International Reading Association, 1989.

Tompkins, Gail. *Teaching Writing: Balancing Process and Product.* Columbus, OH: Merrill Publishing Company, 1990.

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Wurth, Shirley. *Books for You: A Booklist for Senior High Students.* Urbana, IL: National Council of Teachers of English, 1992.

Publications: Periodicals for Language Arts

Language Arts and English Journal

National Council of Teachers of English, 1111 Kenyon Road, Urbana, IL 61801 (217) 328-3870
FAX (217) 328-9645

Portfolio News
Portfolio Assessment Clearinghouse, c/o San Diequito Union High School District, 710 Encinitas Blvd, Encinitas, CA 92024. A quarterly publication produced by educators involved in portfolio assessment.

Reading Today, Journal of Reading, The Reading Teacher, and Reading Research Quarterly
Above available from: International Reading Association, 800 Barksdale Road, P.O. Box 8139, Newark, DE 19714-8139

Publications: Parent Brochures and Booklets for Language Arts

These focus on practical reading concerns of parents and ways for parents to help their children develop reading skills and a lifetime reading habit.

- *Beginning Literacy and Your Child*
- *Creating Readers and Writers*
- *Eating Well Can Help Your Child Learn Better*
- *Encouraging Your Junior High Student to Read*
- *Good Books Make Reading Fun For Your Child*
- *Helping Your Child Become a Reader*
- *How Can I Prepare My Young Child For Reading?*
- *Studying: A Key to Success...Ways Parents Can Help*
- *Summer Reading Is Important*
- *You Can Encourage Your Child To Read*
- *You Can Encourage Your High School Student to Read*
- *You Can Help Your Child Connect Reading to Writing*
- *You Can Help Your Child in Reading by Using the Newspaper*
- *You Can Help Your Young Child with Writing*
- *You Can Prepare Your Child for Reading Tests*
- *You Can Use Television to Stimulate Your Child's Reading Habits*
- *Your Child's Vision Is Important*
- *Your Home Is Your Child's First School*

Available from: International Reading Association, 800 Barksdale Road, P.O. Box 8139, Newark, DE 19714-8139 (302) 731-1600 (800) 336-READ, ext. 266 FAX (302) 731-1057

Publications: Guidelines and Position Statements for Language Arts

Single copies of the following are available free upon request from the National Council of Teachers of English (NCTE) and may be copied without permission from NCTE.

An Introduction to the Guidelines for the Preparation of Teachers of English Language Arts
Summarizes the *1986 Guidelines for the Preparation of Teachers of English Language Arts* discussion on the qualifications for teachers of English Language Arts, preparing effective English Language Arts teachers, and networking with other disciplines.

Basal Readers and the State of American Reading Instruction: A Call for Action
Discusses the technology that our information-age society uses to deal with the problem of illiteracy and recommends ways to improve reading instruction. 1989

Essentials of English: A Document for Reflection and Dialogue
Emphasizes the ways in which English contributes to the knowledge, understanding, and skills of our society. 1982.

Guidelines for a Gender-Balanced Curriculum in English, Grade 7-12
Encourages all English Teachers to integrate literature by and about women into the curriculum during the 1990's. Includes a recommended booklist. 1990.

Guidelines for Judging and Selecting Elementary Language Arts Textbooks
Offers eight guidelines that summarize current theory and research on language learning and provide substantive criteria for judging text materials. 1990.

Lost in the Crowd: A Statement on Class Size and Teacher Workload
Recommendations for schools, districts, and states for reducing class size and modifying instructional techniques that will allow students, as well as teachers, to become actively involved in their education. 1990.

NCTE Forum
Designed to answer questions about where NCTE stands on issues in education, this handbook includes selected Council position statements of the past 20 years on issues affecting the teaching of English. 1989.

Statement of Principles and Standards for the Postsecondary Teaching of Writing
Provides an introduction to writing instruction, details professional standards, and calls for teaching conditions necessary for quality education. 1989.

Teaching Composition: A Position Statement
Defines essential principles in the teaching of writing. 1985.

Teaching Storytelling: A Position Statement from the Committee on Storytelling
Discusses oral storytelling and how storytelling is a unique classroom tool for learning about ourselves, about the ever-increasing information available to us, and about the thoughts and feelings of others. 1992.

Professional Organizations

American Library Association
50 East Huron Street, Chicago, IL 60601 (312) 280-4388 (800) 545-2433 FAX (312) 664-7459

Carnegie Center for Learning and Literacy
251 West Second Street, Lexington, KY (606) 254-4175

Center for the Study of Reading
University of Illinois at Urbana-Champaign. 51 Gerty Drive. Room 174. Champaign. IL 61820
International Reading Association (IRA)
800 Barksdale Road, P.O. Box 8139, Newark, DE 19714-8139 (302) 731-1600 ext. 225
FAX (302) 731-1057
Kentucky Council of Teachers of English/Language Arts (KCTE/LA)
Ken Spurlock, President. Holmes High School, 25th and Madison, Covington, KY 41014 (606) 292-5841
Kentucky State Council/International Reading Association (KCS/IRA)
Sharon Martin. 1752 Plano-Richpond, Bowling Green, KY 42101
Laubach Literacy Action
1320 Jamesville Avenue, Box 131, Syracuse, NY 13210 (315) 422-9121
National Center for Family Literacy
401 South 4th Avenue, Suite 610, Louisville, KY 40202 (502) 584-1133
National Center for the Study of Writing and Literature
School of Education, University of California-Berkeley, Berkeley, CA 94720 (510) 643-7022
National Council of Teachers of English (NCTE)
111 Kenyon Road, Urbana, IL 61801 (217) 328-3870 FAX (217) 328-9645
National Institute for Literacy
800 Connecticut Avenue, Suite 200, Washington, DC 20202-7560 (202) 632-1500
Speech Communication Association (SCA)
5105 Backlick Road, Building E, Annadale, VA 22003 (703) 750-0533 FAX (703) 914-9471
Whole Language Umbrella
Unit 6-846 Marion Street, Winnipeg, Manitoba, Canada R2J0K4 (204) 237-5214
Writing to Learn
Council for Basic Education, 725 15th Street NW, Washington, DC 20005 (202) 347-4171

Instructional Material Resources for Mathematics

Programs

Applied Mathematics: 9-12
Center for Occupational Research Development (CORD) 601-C Lake Air Drive, Waco, TX 76710
(800) 231-3015
Box-It or Bag-It: K-2
Math Learning Center, PO Box 1491, Portland, OR 97201
Elementary-Secondary: Mathematics Comprehensive Materials
National Science Foundation, 1800 G Street NW, Washington, DC 20550 (202) 357- 5000
K-4 Mathematics Specialist Project
Dr. Bill Bush, Director, 305 Dickey Hall, College of Education, University of Kentucky, Lexington, KY 40506-0017 (606) 257-2927
LATTICE (Learning Algebra through Technology Investigation and Cooperative Experiences)
Dr. Bob Ronau, Director. Secondary Education, University of Louisville, Louisville, KY 40292
(502) 588-0593

Math In the Mind's Eye: 5-9
Math Learning Center, PO Box 3226, Salem OR 97302 (800) 547-8887

Mathematics Programs That Work: National Diffusion Network
Janet Stevens, State Facilitator, Kentucky Department of Education, 500 Mero Street, Frankfort, KY 40601 (502) 564-2672

Mathematics Their Way: K-2
Center for Innovation in Education, 20665 4th Street, Saratoga, CA 95070-5800

Publications: Books for Mathematics

Burns, Marilyn. *A Collection of Math Lessons: From Grades 3 through 6.* New Rochelle, NY: The Math Solutions, 1987.

Burns, Marilyn and Bonnie Tank. *A Collection of Math Lessons: From Grades 1 through 3.* New Rochelle, NY: The Math Solutions, 1988.

Charles, Randall, et al. *Problem-Solving Experiences in Mathematics.* Menlo Park, CA: Addison-Wesley Publishing Company, 1985.

Division of Assessment, Kentucky Department of Education. *Kentucky Mathematics Portfolio Teacher's Guide.* Frankfort, KY: Kentucky Department of Education, 1992.

Equals. *Get It Together.* Berkeley, CA: Lawrence Hall of Science, 1989.

Kriendler, Laurie and Barbara Zahm. *MathFINDER Sourcebook: A Collection of Resources for Mathematics Reform.* Armonk, NY: The Learning Team, Inc. 1992.

Kriendler, Laurie and Barbara Zahm. *MathFINDER CD ROM.* Armonk, NY: The Learning Team, Inc., 1992.

Mathematical Sciences Board. *Measuring Up: Prototypes for Mathematics Assessment.* Washington, DC: National Academy Press, 1993.

Stenmark, Jean Kerr, Virginia Thompson, and Ruth Cossey. *Family Math.* Berkeley, CA: Lawrence Hall of Science, 1986.

Publications: Periodicals

AIMS Newsletter
AIMS Education Foundation, P.O. Box 8120, Fresno, CA 93747

Arithmetic Teacher
National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091

COMAP(Consortium for Mathematics and Its Applications)
COMAP, Inc., 60 Lowell Street, Arlington, VA 02174

Mathematics Teacher
National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091

The Elementary Mathematician
COMAP, Inc., 60 Lowell Street, Arlington, VA 02174

School Science and Mathematics
Journal of the School Science and Mathematics Association (SSMA), 126 Life Sciences Building, Bowling Green State University, Bowling Green, OH 43403-0256

Professional Organizations

National Council of Teacher of Mathematics (NCTM)
1906 Association Drive, Reston, VA 22091 (703) 620-9840
Kentucky Council of Teachers of Mathematics (KCTM)
Cynthia Lawson, Membership Chair (502) 875-5367

Manipulatives for Mathematics

Manipulatives are objects which are handled by students to develop an understanding of a concept or to model an experimental situation. The use of manipulatives has been found to enhance student understanding and achievement when it includes the following elements:

- the teacher must be knowledgeable about matching manipulatives to concepts;
- the manipulatives must be used over a long period of time, and;
- the use of manipulatives must be combined with explicit bridges between concrete and abstract concepts.

Manipulative materials can be elaborate and expensive, or simple and teacher-made. Manipulatives suggested for use in the classroom are as follows:

Elementary

Attribute Blocks
Base Ten Blocks
Beansticks
Place Value Mats
Fraction Models
Geoboards
Tangrams
Two-Dimensional Geometric Shapes
Three-Dimensional Geometric Objects
Interlocking Cubes
Number Tiles
Centimeter and Inch Cubes
Objects for Sorting and Counting
Calculators
Objects for Measuring Nonstandard Units
Number Rods
Rulers/Tape Measures
Trundle Wheels
Scales and/or Balances
Objects for Measuring Volume
Thermometers
Clocks
Pattern Blocks
Money
Dice and Spinners
Decimal Models

Middle

Spinners, Chips, Dice
Fraction and Decimal Models
Geoboards
Number Tiles
Cubes
Pattern Blocks
Scales
Rulers
Reflective Devices
Compasses
Protractors
Calculators
Place Value Models
Geometric Shapes and Models
Tangrams
Pentominoes
Tessellation Tiles
Algebra Tiles
Measuring Tools

High

Algebra Tiles
Miras
Polydrons
Geoboards
Tangrams
Pentominoes
Geometric Models (Two-Dimensional and Three-Dimensional)
Volume Demonstration Kits
Probability Tools
Metric Measuring Devices
Tessellation Tiles
Calculators

Instructional Material Resources for Practical Living

Publications: Books

Association for the Advancement of Health Education (AAHE). *HIV Prevention Education for Elementary and Middle School Grades*. Atlanta, GA: Center for Disease Control, 1992.

Cochran, N., L. Wilkinson, and J. Furlow. *A Teacher's Guide to Elementary School Physical Education.* Dubuque, IA: Kendall/Hunt Publishing Company, 1982. Fourth ed.

Jefferson County Public Schools and the Kentucky Department of Education. *Prevention of Family Violence.* Frankfort, KY: Kentucky Department of Education, 1989.

Kentucky Department of Education. *Parenting and Family Life Skills Education: Teachers Training Module.* Frankfort, KY: Kentucky Department of Education, 1989.

Kentucky Department of Education. *Resource Directory: Kentucky Aids Prevention Education Program.* Frankfort, KY: Kentucky Department of Education, 1992.

Kentucky Department of Education, Division of Secondary Vocational Education. *Life Skills.* Frankfort, KY: Kentucky Department of Education, 1993.

Kentucky Department of Education, Division of Secondary Vocational Education. *Consumer Economics.* Frankfort, KY: Kentucky Department of Education, 1993.

Kentucky Department of Education, Division of Secondary Vocational Education. *Parenting.* Frankfort, KY: Kentucky Department of Education, 1993.

Kentucky Department of Education, Division of Secondary Vocational Education. *Relationships.* Frankfort, KY: Kentucky Department of Education, 1993.

Kotnour, M. *Physical Fitness Games and Activities Kit.* West Nyack, NY: Parker Publishing Company, 1990.

Quackenbush, Marcia and Sylvia Villareal, MD. *Does Aids Hurt? Educating Young Children About Aids.* Santa Cruz, CA: 1992.

Rohnke, K. *The Bottomless Bag: Bag of Tricks.* Dubuque, IA. Kendall/Hunt Publishing Company, 1991.

Turner, L.F. and S. Turner. *Physical Education Teacher's Activities Program: Skill by Skill.* West Nyack, NY: Parker Publishing Company, 1991.

Wheeler, K and O. Spilker. *Physical Education Curriculum Activities Kit.* West Nyack, NY: Parker Publishing Company, 1991.

Wnek, B. *Holiday Games and Activities.* Champaign, IL: Human Kinestics Book, 1992.

Professional Organizations

American Home Economics Association (AHEA)
1555 King Street, Alexandria, VA 22314 (703) 706-4600 FAX (703) 706-HOME

Kentucky Association of Health, Physical Education, Recreation, and Dance (KAHPERD)
Burch Oglesby, Executive Director. Western Kentucky University, Bowling Green, KY 42101.

National Associations of Health, Physical Education, Recreation, and Dance (NAHPERD)
1900 Association Drive, Reston, VA 22091

National Association for Sport and Physical Education (NASPE)
1900 Association Drive, Reston, VA 22091 (703) 476-3412

National Council for Economic Education (NCEE)
432 Park Avenue, New York, NY 10016 (212) 685-5499

Instructional Material Resources for Science

Programs

Activity Centered Elementary Science (ACES): K - 6
Director of Education Programs, Kentucky Science and Technology Council, P.O. Box 1049, Lexington, KY 40588 (606) 233-3502

Activities Integrating Mathematics and Science (AIMS): K - 6
AIMS Education Foundation, P.O. Box 7766, Fresno, CA 93747 (209) 291-1766

Chemical Education for Public Understanding Program (CEPUP): Middle Level
Lawrence Hall of Science, University of California, Berkeley, CA 94720 (510) 642-8718

Chemistry Lab Implementation Project (CLIP): High School
Kentucky Science and Technology Council, P.O. Box 1049, Lexington, KY 40588-1049 (606) 233-3502

Great Explorations in Math and Science (GEMS): Grades 4 - 8
Lawrence Hall of Science, University of California, Berkeley, CA 94720 (510) 642-7771

International and Regional Science and Engineering Fairs
Science Service, 1719 N Street N.W., Washington, DC 20036 (202) 785-2255

Junior Science and Humanities Symposium: High School
Academy of Applied Science, 98 Washington St., Concord, NH 03301 (603) 228-4520

Kentucky Junior Academy of Science: Middle and High School
Dr. Valgene Dunham, Western Kentucky University, Biology Department, Bowling Green, KY 42101 (502) 745-3696

Kentucky Science Olympiad: Middle and High School
Kentucky Department of Education, 1829 Capital Plaza Tower, Frankfort, KY 40601 (502) 564-2106

Kentucky Telecommunications Network (KYNet)
Science Consultant, Kentucky Department of Education, 500 Mero Street, Frankfort, KY 40601 (502) 564-2106

Partnership for Reform Initiatives in Science and Mathematics (PRISM)
National Science Foundation Grant, Dr. Daniel Ochs, Science Component Director, Kentucky Department of Education, 500 Mero St., Frankfort, KY 40601 (502) 564-4394

Regional PRISM Directors for Science Initiatives:

Eastern Kentucky University	Dr. Bob Miller	(606) 622-2167
Morehead State University	Dr. Ben Malphrus	(606) 783-2212
Murray State University	Dr. John Guyton	(502) 762-2103
Northern Kentucky University	Dr. Ron Gardella	(606) 572-6380
University of Kentucky	Dr. Ron Atwood	(606) 257-3292
University of Louisville	Dr. Karen Lind	(502) 588-6431
Western Kentucky University	Dr. Terry Wilson	(502) 745-4424

National Science Olympiad: K -12 materials available.
5955 Little Pine Lane, Rochester, MI 48064 (313) 651-4103

Newton's Apple
National Science Teachers Association, 1742 Connecticut Avenue NW, Washington, DC 20009-1171

Outdoor Biology Instructional Strategies (OBIS)
Delta Education, Inc., Box M, Nashua, NH 03061
People Sharing Information Network (PSINET),
JaKel, Inc., 585 Southfork Drive, Waukee, IA 50263 (515) 225-6317
Project RAMPS: Relationships and Mathematics in Physical Science
P.O. Box 712, Devon, PA 19333 (800) 444-5729
Project Wild
Kentucky Department of Fish and Wildlife Resources, Division of Information and Education, #1 Game Farm Road, Frankfort, KY 40601 (502) 564-4762
Science Curriculum Improvement Study 3 (SCIS3)
Delta Education, Inc., Box 915, Hudson, NH 03051
Space Science Student Involvement Project: Gr. 3 -12
National Science Teachers Association, 1742 Connecticut Ave. NW, Washington, DC 20009-1171 (202) 328-5800
The Total Science Safety System: Science Teaching and the Law - Safety and Chemical Management
JaKel, Inc., 585 Southfork Drive, Waukee, IA 50263 (515) 225-6317
Science Programs That Work: National Diffusion Network
Office of Educational Research and Improvement, 555 New Jersey Avenue, NW, Washington, DC 20208 (202) 357-6149
Science Sleuths
Videodiscovery, Inc., 1700 Westlake Avenue North, Suite 600, Seattle, WA 98109-3012 (206) 285-5400 (800) 548-3472
Windows on Science
Optical Data Corporation, 30 Technology Drive, P.O. Box 4919, Warren, NJ 07060 (201) 668-0022 (800) 524-2481
3-2-1 Classroom Contact
GPN University of Nebraska-Lincoln, P.O. Box 80669, Lincoln, NE 68501-0669 (402) 472-2007 (800) 228-4630

Publications: Books for Science

American Association for the Advancement of Science. *Science Books and Films.* Washington, DC: American Association for the Advancement of Science, 1991.

Barhydt, Frances and Paul Morgan. *The Science Teacher's Book of Lists.* Englewood Cliffs, NJ: Prentice Hall, 1993.

Butzow, Carol and John. *Science Through Children's Literature: An Integrated Approach.* Englewood, CO: Teacher Ideas Press, 1989.

Cheek, Dennis, Robert Briggs, and Robert Yager, eds. *Science Curriculum Resource Handbook: A Practical Guide for K-12 Science Curriculum.* Millwood, NY: Kraus International Publications, 1992.

College Entrance Examination Board. *Academic Preparation in Science.* New York, NY: College Entrance Examination Board, 1990.

Eggen, Paul and June Main. *Developing Critical Thinking Through Science, Book 2.* Pacific Grove, CA: Critical Thinking Press & Software, 1990.

Facts on File. *Science Experiments on File.* New York, NY: Facts on File, 1989.

Helgeson, Stanley, Robert Howe, and Patricia Blosser. *Promising and Exemplary Programs and Materials in Elementary and Secondary Schools - Science: Science Education Information Report.* Columbus, OH: Clearinghouse for Science and Mathematics, 1990.

Holdzkom, David and Pamela Lutz, eds. *Research within Reach: Science Education.* Charleston, WV: Research and Development Interpretations Service, Appalachia Educational Laboratory, 1984.

Kovalik, Susan and Karen Olsen. *Kid's Eye View of Science: A Teacher Handbook for Implementing an Integrated Thematic Approach to Teaching Science*, K-6. Oak Creek, AZ: Center for the Future of Public Education, 1991.

Kraus International. *Science Curriculum Resource Handbook.* Millwood, NY: Kraus International Publications, 1992.

LHS GEMS. *To Build a House: GEMS and the "Thematic Approach" to Teaching Science.* Berkeley, CA: Regents of the University of California, 1991.

Lennon, Mary Beth and Barbara Walthall, eds. *Sourcebook for Science, Mathematics and Technology Education, 1992.* Washington, DC: American Association for the Advancement of Science, 1992.

Main, June and Paul Eggen. *Developing Critical Thinking through Science, Book 1.* Pacific Grove, CA: Critical Thinking Press and Software, 1991.

Moutran, Julia. *Science Teachers Almanac: Practical Ideas and Activities for Every Month of the School Year.* West Nyack, NY: The Center for Applied Research in Education, 1992.

National Science Resources Center. *Science for Children: Resources for Teachers.* Washington, DC: National Academy Press, 1988.

National Science Teachers Association. *Science and Math Events: Connecting and Competing.* Washington, DC: National Science Teachers Association, 1990.

National Wildlife Federation. *Ranger Rick's Nature Scope.* Washington, DC: National Wildlife Federation, 1989.

Prentice Hall Science. *Teacher's Desk Reference: A Professional Guide for Science Educators.* Englewood Cliffs, NJ: Prentice Hall, 1993.

Roth, Charles and Linda Lockwood. *Strategies and Activities for Using Local Communities as Environmental Education Sites.* Columbus, OH: Clearinghouse for Science and Mathematics, 1979.

Tchundi, Stephen and Margie Huerta. *Teaching and Writing in the Content Areas.* National Education Association Professional Library, 1983.

United States Department of Energy. *Education Programs 1992.* Oak Ridge, TN: Office of Scientific and Technical Information, 1992.

Walthall, Barbara and Janice Merz, eds. *American Association for the Advancement of Science Education Directory, 1989.* Washington, DC: American Association for the Advancement of Science, 1989.

Publications: Periodicals for Science

American Biology Teacher
National Association of Biology Teachers, 11250 Roger Bacon Drive, Reston, VA 22090

Journal of Research in Science Teaching
John Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10016

Nature Study
The American Nature Study Society, 5881 Cold Brook Road, Homer, NY 13077

Science Activities
Heldref Publications, 4000 Albermarle Street, NW, Suite 512, Washington, DC 20016

Science and Children
1742 Connecticut Avenue NW, Washington, DC 20009
Science, and *Science Books and Films*
American Association for the Advancement of Science, 1333 H Street NW, Washington, DC 20005 (202) 326-6410
Science and You
University of Kentucky, Research and Graduate Studies, 404 Kinkead Hall, Lexington, KY 40506-0057
Science News
1719 N Street NW, Washington, DC 20036 (202) 785-2255
Science Scope
1742 Connecticut Avenue NW, Washington, DC 20009
Science World Magazine
Scholastic, Inc., 902 Sylan Avenue, Box 2001, Englewood Cliffs, NJ 07632
Scientific American
910 17th Street, NW, Washington, DC 20006 (202)-457-9592
The Physics Teacher
American Association of Physics Teachers, 5110 Roanoke Place, Suite #101, College Park, MD 20740
The Science Teacher
1742 Connecticut Avenue, NW, Washington, DC 20009

Professional Organizations and Resources for Science

American Association for the Advancement of Science (AAAS)
1333 H Street NW, Washington, DC 20005 (202) 326-6624
American Astronomical Society (AAS)
2000 Florida Avenue NW, Washington, DC 20009 (202) 328-2010
American Chemical Society (ACS)
1155 16th Street, NW, Washington, DC 20036 (202) 872-4388
American Meteorological Society (AMS)
45 Beacon Street, Boston, MA 02108 (617) 227-2425
Appalachia Educational Laboratory (AEL)
1031 Quarrier Street, P.O. Box 1348, Charleston, WV 25325 (304) 347-0400 (800) 624-9120
Eisenhower National Clearinghouse for Mathematics and Science Education
Ohio State University, 104 Research Center, 1314 Kinnear Road, Columbus, OH 43212 (614) 292-1431 FAX (614) 292-1595
ERIC Clearinghouse for Science, Mathematics and Environmental Education (ERIC/SMEAC)
1200 Chambers Road, Columbus, OH 43212 (614) 292-6717
Kentucky Academy of Science (KAS)
P.O. Box 22313, Lexington, KY 40522
Kentucky Association for Environmental Education (KAEE)
3200 Tucker Station Road, Louisville, KY 40299 (502) 267-8919
Kentucky Association of Biology Teachers (KABT): National Association of Biology Teachers Affiliate, 11250 Roger Bacon Drive, # 19, Reston, VA 22090
Kentucky's Aviation and Space Education Resource Center
Eastern Kentucky University, Hummel Planetarium, Richmond, KY 40475 (606) 622-1547
Kentucky's NASA Teacher Resource Center
Murray State University, Waterfield Library, Media and Curriculum Resource Department, Murray, KY 42071 (502) 762-2850

Kentucky Physics Teachers Association (KPTA): American Association of Physics Teachers Affiliate 5112
Berwyn Road, College Park, MD 20740 (301) 345-4200
Kentucky Science and Technology Council (KSTC)
Director Science Education Programs, P.O. Box 1049, Lexington, KY 40588 (606) 233-3502
FAX (606) 259-0986
Kentucky Science Teachers Association (KSTA)
1026 Club Drive, Goshen, KY 40026 (502) 228-3206
Kentucky Space Grant Consortium
Thomas Coohill, Director. Western Kentucky University, Department of Physics and Astronomy,
1526 Russellville Road, Bowling Green, KY 42101 (502) 745-4357
Lawrence Hall of Science
University of California, Berkeley, CA 94720 (510) 642- 7771
National Academy of Sciences (NAS)
2101 Constitution Avenue NW, Washington, DC 20077-5576
National Association for Science, Technology, and Society (NATS)
117 Williard Building, Pennsylvania State University, University Park, PA 16802 (814) 865-3046
National Center for Improving Science Education
2000 L. Street NW, Suite 603, Washington, DC 20036 (202) 467-0652 FAX (202) 467-0659
National Science Foundation (NSF)
1800 G Street, NW, Washington, DC 20550 (202) 357-5000
National Science Resources Center
Arts and Industries Building, Room 1201, Smithsonian Institution, Washington, DC 20560 (202) 357-2555
National Science Teachers Association (NSTA)
1742 Connecticut Avenue NW, Washington, DC 20009 (202) 328-5800
North American Association for Environmental Education (NAAEE)
P.O. Box 400, Troy, OH 45373 (513) 676-2514

Science and Mathematics Alliances: Funded by Eisenhower Grants

District Six Science and Mathematics Alliance
John C. Philley, Director. Morehead State University (606) 783-2002
District Three Alliance
John A. Oppelt, Director. Bellarmine College (502) 452-8490
Western Kentucky Alliance
Kenneth Phillips, Director. Madisonville Community College (502) 821-2250
Fifth District Alliance
Don Ryoti, Director. Eastern Kentucky University (606) 622-5942
Mathematics / Science Alliance - Region Four
Paul Blankenship, Director. Lexington Community College (606) 258-2272
Mathematics / Science Alliance - Region 1
Joseph Baust, Director. Murray State University (502) 762-2537
Mathematics / Science Alliance - Region Four North
Linda Sheffield, Director. Northern Kentucky University (606) 572-5431

Consortium of Kentucky Physics Alliance
Vincent Di'Noto, Director. Jefferson Community College (502) 935-9840 ext. 280
Louisville Area Chemistry Alliance
Amy Phelps, Director. University of Louisville (502) 588-5932

Instructional Material Resources for Social Studies

Programs

Citizen Bee
Nancy Gilligan, Coordinator. Fayette County Schools, 701 East Main, Lexington, KY 40502
Geography Bee
Kate Fischer, Coordinator. 2819 Elanor Avenue, Louisville, KY 40205
Kentucky Mock Trial Competition
Elizabeth Lucas, Coordinator. Administrative Office of the Courts, Frankfort, KY 40601
Kentucky United Nations Assembly (KUNA)
State YMCA. 402 Broadway, Frankfort, KY 40601
The Stock Market Game
Jan Heiman, Coordinator. Kentucky Council on Economic Education, 203 East Jefferson, Louisville, KY 40202

Publications: Books

Atwood, Virginia A., ed. *Elementary School Social Studies: Research as a Guide to Practice.* Washington, DC: National Council for the Social Studies, 1986.

Dobkin, William S., ed., et al. *A Handbook for the Teaching of Social Studies.* Boston, MA: Allyn and Bacon, Inc., 1985.

Jenness, David. *Making Sense of Social Studies.* New York, NY: MacMillan Publishing Company, 1990.

Kraus International. *Social Studies Curriculum Resource Handbook: A Practical Guide for K-12 Social Studies Curriculum.* Millwood, NY: Kraus International Publications, 1992.

Laughlin, Mildred Knight and Patricia Payne Kardaleff. *Literature-based Social Studies: Children's Books and Activities to Enrich the K-5 Curriculum.* Phoeniz, AZ: The Oryx Press, 1991.

National Commission on Social Studies in the Schools. *Charting a Course: Social Studies for the 21st Century.* Washington, DC: National Commission on Social Studies in the Schools, 1989.

Parker, Walter C. *Renewing the Social Studies Curriculum.* Alexandria, VA: Association for Supervision and Curriculum Development, 1991.

Rosenzweig, Linda W., ed. *Developmental Perspectives on the Social Studies.* Washington, DC: National Council for the Social Studies, 1982.

Shaver, James P., ed. *Handbook of Research on Social Studies Teaching and Learning.* New York, NY: MacMillan Publishing Company, 1991.

Wronski, Stanley and Donald Bragaw, eds. *Social Studies and Social Sciences: A Fifty-Year Perspective.* Washington, DC: National Council for the Social Studies, 1986.

Publications: Articles/Brochures for Social Studies

Academic Freedom Committee. "Academic Freedom and the Social Studies Teacher." *Social Education.* January, 1991.

Association for Supervision and Curriculum Development. "*Social Studies.*" *ASCD Curriculum Handbook.* Alexandria, VA: Association of Supervision and Curriculum Development, 1991.

Brophy, Jere E. and Janet Alleman. "Elementary Social Studies Should be Driven by Major Social Education Goals." *Social Education.* January 1992.

NCSS Task Force of Ethnic Studies Curriculum Guidelines. "Curriculum Guidelines for Multicultural Education." *Social Education.* September 1992: 274.

National Council for the Social Studies. "Alternative Scopes and Sequences." *Social Education.* October, 1989: 375.

National Council for the Social Studies. "Social Studies for Early Childhood and Elementary School Children Preparing for the 21st Century." *Social Education.* January 1989: 14.

National Council for the Social Studies. *The Essential Statements: Essentials of Social Studies.* Washington, DC: National Council for the Social Studies, 1991.

Nickell, Pat, ed. "Special Section: Student Assessment in the Social Studies." *Social Education.* February 1992: 89.

Wassermann, Selma. "A Case for Social Studies." *Kappan.* June 1992: 793.

Publications: Periodicals

Multicultural Review
Greenwood Publishing Group, Inc., 88 Post Road West, P.O. Box 5007, Westport, CT 06881-5007.

Social Education
National Council for the Social Studies, 3501 Newark Street NW, Washington DC, 20016. (202) 966-7840.

Social Studies and the Young Learner
The National Council for the Social Studies, P.O. Box 90364, Washington, DC

Social Studies Review
The American Textbook Council, 475 Riverside Drive, Room 518, New York, NY 10115
(212) 870-2700.

Southern Social Studies Journal
The Kentucky Council for the Social Studies, UPO 738, Morehead State University, Morehead, KY 40351.

Professional Organizations

Alliance for Education in Global and International Studies (AEGIS)
Stanford University, 300 Lausen Room 14, Stanford, CA 94305 (415) 725-1494 FAX (415) 723-6784

American Historical Association (AHA)
400 A Street SE, Washington, DC 20003

Kentucky Association of Teachers of History (KATH)
Denver Fugate, President. Elizabethtown Community College, 600 College Street Road, Elizabethtown, KY 42701

465

Kentucky Council for the Social Studies (KCSS)
Ora Nall, President. 2815 Delaware Drive, Owensboro, KY 42301
Kentucky Council on Economic Education (KCEE)
200 East Jefferson Street, Louisville, KY 40202 (502) 584-2100
Kentucky Geographic Alliance
Dr. Dennis Spetz, Coordinator. University of Louisville, Louisville, KY 40292
Dr. Albert Peterson, Coordinator. Western Kentucky University, Bowling Green, KY 42101
National Council for Economic Education (NCEE)
432 Park Avenue, South, New York, NY 10016 (212) 685-5499
National Council for History Education (NCHE)
Elaine Wrisley Reed, Executive Secretary. 26915 Westwood Road, Suite B-2, Westlake, OH 44145 (216) 835-1776
National Council for the Social Studies (NCSS)
3501 Newark Street NW, Washington, DC 20016 (202) 966-7840

Instructional Material Resources for Vocational Studies

Programs

COIN Micro Junior: Career Exploration and High School Planning for Junior High
COIN Educational Products, 3361 Executive Parkway, Suite 302, Toledo, OH 43606
College Finder
Wintergreen Software, Inc., P.O. Box 15899, New Orleans, LA 70175
Social Skills on the Job: Career and Social Skills Training
The Conover Company, P.O. Box 155, Omro, WI 54963

Publications: Books

Bingham, Mindy and Sandy Stryker. *Career Choices: A Guide for Teens and Young Adults.* Santa Barbara, CA: Able Publishing, 1990.

Bolles, R.N. *What Color is Your Parachute?* Berkeley, CA: Ten Speed Press, 1993.

Educational Development and Training Center. *Computerized Competency Profile.* Commerce, TX: East Texas University, 1990.

Educational Development and Training Center. *Educational and Career Planning Instructional Guide.* Commerce, TX: East Texas University, 1989.

Educational Development and Training Center. *Guidelines for Conducting a Quality Career Investigation Program.* Commerce, TX: East Texas University, 1990.

Educational Development and Training Center. *Inservice Model for Strenghtening Secondary Teachers' Skills in Career Counseling.* Commerce, TX: East Texas University, 1986.

Educational Development and Training Center. *Self-Appraisal Instructional Guide.* Commerce, TX: East Texas University, 1986.

Farr, J.M. *Getting the Job You Really Want.* Indianapolis, IN: JIST Works, Inc., 1988.

Farr, J. Michael, ed. *Complete Guide for Occupational Exploration.* Indianapolis, IN: JIST Works, 1993.

Jones, Lawrence, ed. *Encyclopedia of Career Change and Work Issues.* Phoenix, AZ: Oryx Press, 1992.

Kimbrell, G., and B. Vineyard. *Succeeding in the World of Work.* Mission Hills, CA: Glencoe, 1992.

Kimeldorf, M. *Pathways to Work.* Bloomington, IL: Meridian, 1989.

McCain, Barbara. *Careers: Chance or Choice: A Teaching Strategy/Curriculum to Motivate the Academics.* Cordova, TN: GMH Publications, 1991.

U.S. Department of Labor. *The Occupational Outlook Handbook.* Washington, DC: Department of Labor, 1990.

U.S. Department of Labor. *The Dictionary of Occupational Titles.* Washington, DC: Department of Labor, 1977.

Instructional Software for Vocational Studies

Career Directions
Career Finder
Careers of the Future
Computerized Career Assessment and Planning Program
Job Attitudes: Assessment and Improvement
The Work Activities Inventory
Working With Others
Working With an Organization

Above available from Johnson and Rudolph, 1027 Broadway, Bowling Green, KY 42104
(800) 248-5212

The School Survival Video Game

Educational Development and Training Center, East Texas University Center,
Commerce, TX 75429 (214) 886-5624 (800) 356-EDTC

Videos

HEADS UP: Attitudes About Work and Customers
Is There Life After High School? Planning Your Future
Preparing for the Jobs of the 1990's: What You Should Know
The Johnson/Rudolph Career Finder Video Service
Working for a Living: Job Skills for the Real World

Above available from Johnson and Rudolph, 1027 Broadway, Bowling Green, KY 42104 (800) 248-5212

Career Exploration: A Job Seeker's Guide
Career Planning Steps

Above available from Educational Development and Training Center, East Texas State University Center, Commerce, TX 75429 (214) 886-5624 (800) 356-EDTC

Professional Organizations

American Home Economics Association (AHEA)
1555 King Street, Alexandria, VA 22314 (703) 706-4600 FAX (703) 706-HOME

American Vocational Association (AVA)
1410 King Street, Alexandria, VA 22314 (703) 683-3111 FAX (703) 683-7424

International Technology Education Association (ITEA)
1914 Association Drive, Reston, VA 22091-1502.

Kentucky Association of Vocational Special Needs (KAVSNP)
Pat Vencill, President, Madison Central High School, 705 North Second Street, Richmond, KY 40475.

Kentucky Business Education Association (KBEA)
Ginny Richardson, Murray State University, Office Systems Business Education, Murray, KY 42071 (502) 762-4257

Kentucky Home Economics Association (KHEA)
Fran Maierhauser, Administrative Assistant. 4432 Cordova Road, Louisville, KY 40207-3422 (502) 895-8842

Kentucky Industrial Education Association (KIEA)
Bob Sillman, President. KY-Tech Region 5, Elizabethtown, KY 42071

Kentucky Marketing Education Association (KMEA)
Ray Roaden, President. Corbin High School, 1901 Snyder Road, Corbin, KY 40701 (606) 528-3902

Kentucky Vocational Association (KVA)
Gerald Slain, Executive Director. 626 Oak Hill Road, Somerset, KY 42501 (606) 678-5974

Marketing Education Association (MEA)
1375 King Avenue, Columbus, OH 43212 (614) 486-6708

National Association of Vocational Special Needs (NAVSNP)
Sandy Schmits, Special Populations Supervisor. Iowa Department of Education, Grimes State Office Building, Des Moines, IA 50319-0146

National Business Education Association (NBEA)
1914 Association Drive, Reston, VA 22091-1596 (703) 860-8300

General Instructional Material Resources

Publications: Books

ASCD Curriculum Handbook
Curriculum/Technology Resource Center. Association for Supervision and Curriculum Development, 1250 North Pitt Street, Alexandria, VA 22314-1403.

ASCD Curriculum Materials Directory
Curriculum/Technology Resource Center. Association for Supervision and Curriculum Development, 1250 North Pitt Street, Alexandria, VA 22314-1403.

ASCD Video Training Programs: Resources for Restructuring Schools
Association for Supervision and Curriculum Development, 1250 North Pitt Street, Alexandria, VA 22314-1403.

Brown's Directory of Instructional Programs
Infinity Impressions, Ltd., 88 East Main Street, Suite 500, Mendham, NJ 07945

Price varies with size of publication. This publication provides concise information regarding commercial, instructional programs to assist with selection decisions. Separate documents are available for Foreign Language, 7-12; Language Arts/Spelling/Handwriting, K-8; Language Arts, 7-12; Mathematics, K-8; Mathematics, 7-12; Reading, K-8, Science/Health, K-8; Science/Health, 7-12; Social Studies, K-8; Social Studies, 7-12; Vocational Education, 7-12; and Whole Language/Literature, K-8. Each entry provides a profile of the product which includes the following:

- bibliographic information,

- grade level(s),
- special features,
- detailed description of components, and
- customer service information.

Educators Index of Free Materials
Educators Progress Service, Inc., 214 Center Street, Randolph, WI 53956

Educational Testing Service Publications (ETS)
P.O. Box 6736, Princeton, NJ 08541-6736

ERIC Directory of Education-Related Information Centers
Washington, DC: Educational Resource Information Center, 1992.

Guide to U.S. Department of Education Programs
Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402

Kraus Curriculum Resource Handbooks
Route 100, Millwood, NY 10546 (914) 762-2200 (800) 223-8323

This publication provides basic resources for creating curricula reflecting the various disciplines. Separate documents are available in Language Arts, English as a Second Language, Early Childhood Education, Mathematics, Science, and Social Studies. The books include the following:

- Annotated list of exemplary curriculum materials
- List of publishers
- Sources of ideas for special projects
- Design ideas
- Index of reviews

Products and Services Brochure
National Resource Center for Middle Grades Education, University of South Florida, College of Education, EDU 118, Tampa, FL 33620-5650 (813) 974-2530

Professional and Organization Development Programs
American Association of School Administrators and National Academy for School Executives, 1801 North Moore Street, Arlington, VA 22209-9988

The Curriculum Leader
Curriculum Leadership Institute, 2950 Rio Vista Drive, Emporia, KS 66801

Treasure Chest: A Teacher Advisory Sourcebook
Hoversten, Cheryl, Nancy Doda, and John Lounsbury. National Middle School Association. Columbus, OH: 1991

General Publications: Periodicals

Education Daily
Education Grants Alert
Education Monitor
Education USA
Federal Grants and Contracts Weekly
Foundation & Corporate Grants Alert
Report on Education Research
School Law News

Special Education Report
Student Aid News
The Catalog of Federal Education Grants
Vocational Training News
    Above available from Capitol Publications, Inc., 1101 King Street, P.O. Box 1453, Alexandria, VA 22313-2053 (800) 327-7203 FAX (703)739-6517
Educational Literature Review
    Management Development Associates, P.O. Box 9328, Winterhaven, FL 33883-9328 (813) 293-4882

Other Resources

Educational Research Information Center (ERIC)
    Access ERIC, 1600 Research Boulevard, Rockville, MD 20850 (800) USE-ERIC
Eisenhower National Clearinghouse
    1314 Kinnear Road, Columbus OH 43212 (619) 292-7784 FAX (614) 292-2066 email: Isimutis @ magnus.acs.ohio-state.edu
National Diffusion Network
    Janet Stevens, Project Director. Kentucky Department of Education, 500 Mero Street, 1722 Capital Plaza Tower, Frankfort, KY 40601
Public Broadcasting Service
    PBS Elementary/Secondary Service, 1320 Braddock Place, Alexandria, VA 22314-1698 (703) 739-5402 FAX (703) 739-8495
United States Department of Education, Office of Education Research and Improvement, Washington, DC (800) USE- ERIC

General Professional Organizations

American Association of Colleges for Teacher Education (AACTE)
    One Dupont Circle NW, Suite 610, Washington, DC 20036 (202) 293-2450 FAX (202) 457-8095
American Association of School Administrators/National Academy for School Executives (AASA/NASE)
    11801 North Moore Street, Arlington, VA 22209-9988 (703) 528-0700
American Council of Learned Societies (ACLS)
    228 East 45th Street, New York, NY 10017-3398 FAX (212) 949-8058
American Federation of Teachers (AFT)
    555 New Jersey Avenue NW, Washington, DC 20001
American Library Association (ALA)
    50 E Huron Street, Chicago, IL 60601 (312) 280-4388 (800) 545-2433 FAX (312) 664-7459
Association for Supervision and Curriculum Development (ASCD)
    1250 North Pitt Street, Alexandria, VA 22314 (703) 549-9110 ext. 300 FAX (703) 549-3891
Association of Teacher Educators (ATE)
    1900 Association Drive, Suite ATE, Reston, VA 22901 (703) 620-3110 (703) 620-9530
Council for Basic Education (CBE)
    725 15th Street NW, Washington, DC 20005 (202) 347-4171 FAX (202) 347-5047
Education Commission of the States (ECS)
    707 17th Street, Suite 2700, Denver, CO 80202 (303) 299-3652 FAX (303) 296-8332

Kentucky Association of School Administrators (KASA)
Louisville Road, Frankfort, KY 40601 (502) 875-3411
Kentucky Middle School Association (KMSA)
P.O. Box 3062, Frankfort, KY 40603
National Association for Core Curriculum, Inc.
404 White Hall, Kent State University, Kent, OH 44242. Dr. Gordon F. Vars, Executive Secretary/Treasurer (216) 672-2792
National Association for Elementary School Principals (NAESP)
1615 Duke Street, Alexandria, VA 22314-3483 (703) 684-3345
National Association for Secondary School Principals (NASSP)
1904 Association Drive, Reston, VA 22091 (703) 860-0200
National Education Association
1201 16th Street NW, Washington, DC 20036 (202) 822-7369 FAX (202) 822-7482
National Middle School Association (NMSA)
4807 Evanswood Drive, Columbus, OH 43229-6292
Quality Education for Minority Network (QEMN)
1818 North Street NW, Suite 350, Washington, DC 20036 (202) 659-1818 FAX (202) 659-5408

General Networks and Resources

African-American Critical Issues Network
Delores R. Greene. Richmond Public Schools, 301 North 9th Street, 15th Floor, Richmond, VA 23219 (804) 780-6926
Alliance to Enhance Teaching of Science
Ira Hiberman. Penns Valley School District, RD2, Box 116, Spring Mills, PA 16875 (814) 422-8824
Arts in Education
Richard Sinatra. St. John's University, Grand Central and Utopia Parkways, Jamaica, NY 11439 (718) 990-6358
ASCD High School Futures II Network
Ronald Tesch, Highland Park High School, 433 Vine Street, Highland Park, IL 60035 (708) 432-6510
Authentic Assessment Network
Albert N. Koshiyama. Local Evaluation Assistance, California Department of Education, 721 Capitol Mall, Sacramento, CA 95814 (916) 324-7147
Clearinghouse for Learning/Teaching Styles and Brain Behavior
Kathleen Butler. The Learner's Dimension, 7 Lakeview Drive, Columbia, CT 06237 (203) 228-3786
Conflict Resolution Resources
The Community Board Program, 1540 Market Street, Suite 490, San Francisco, CA 94102 (415) 552-1250 FAX (415) 626-0595
Cooperative Learning
Harlan Rimmerman. Kansas City Schools, 625 Minnesota, Kansas City, KS 66101 (913) 621-3073
Curriculum Associates, Inc.
5 Esquire Road, North Billerica, MA 01862-2589
Curriculum Teachers (emphasis on teaching)
Marilyn Winters. California State University at Sacramento, 6000J Street, Sacramento, CA 95819 (916) 278-5517

Designing District Evaluation Instruments for Math and Science Process Skills
    Shelley Ann Lipowich. 6321 North Canon del Pajaro, Tucson, AZ 87515 (602) 299-9583
Early Childhood Education
    Shirle Moone Childs, Curriculum and Instruction. Windham Public Schools, 26 Regency Drive,
    Windsor, CT 06095 (203) 683-0030
Educational Futurists
    Helen J. Wallace. 371 Patterson Street, Ashland, OR 97520 (503) 488-5824
Emergent Literacy and the Culturally or Linguistically Different Student
    Zelene Lovitt. Carrollton-Farmers Branch I S D, 7856 La Cabeza, Dallas, TX 75248 (214) 247-7153
Equity Issues
    Joyce Clark Waugh. University of West Virginia, College of Graduate Studies, 210 Minnesota
    Avenue, Beckley, WV 25801 (304) 252-0719
High Schools Networking for Change
    Jim Ford. Sheldon High School, 2455 Willakenzie Road, Eugene, OR 97401 (503) 687-3381
Holistic Education
    John Palladino. Long Island University, C W Post Campus, Brookeville, NY 11548 (516) 299-2374
Instructional Supervision
    Jean M. Smith. Hilliard City Schools, 5491 Scioto Darby Road, Hilliard, OH 43026 (614) 876-1286
Interdisciplinary Curriculum
    Benjamin P. Ebersole. Hershey Public Schools, Box 898, Hershey, PA 17033 (717) 534-2501 ext. 252
Intergenerational/Family Literacy
    Maryann E. Nuckolls. Tucson Unified School District, 150 West Ajo Way, Tucson, AZ 85714 (602)
    798-2740
Learning Community Network (teacher/administrator collaboration in research and practice)
    F. James Clatworthy. School of Education, Oakland University, Rochester, MI 48309-4401 (313) 370-
    3052
Manipulative Mathematics
    Rosemarie Dyer. Black Elementary School, 14100 Heritage, Sterling Heights, MI 48310 (313) 825-
    2840
Middle Schools Network
    Evelyn Maycumber. Middle Grades Staff Development Center, North East Florida Educational
    Consortium, Route 1, Box 8500, Palatka, FL 32177 (904) 329-3800
National Occupational Information Coordinating Committee (NOICC)
    2100 M Street, NW, Suite 156, Washington, DC 20037 (202) 653-7680
The Network for Outcome-Based Schools
    NOBS Membership Services. TIES 1925 W County Road B2, Roseville, MN 55113-2791 (612) 638-
    2339
Network for Restructured Schools
    Melanie Barron. University of Lowell, Center for Field Services and Studies, Read Hall, West Campus,
    Lowell, MA 01854 (508) 934-4650
NOICC Training Support Center (NTSC)
    Oklahoma Department of Vocational and Technical Education, 1500 West Seventh Avenue, Stillwater,
    OK 74074-4364 (405) 743-5197
Pull-In Model for Compensatory Education
    Rebecca Robinson Yarlott. Hale Elementary School, 1200 East 54th Street, Minneapolis, MN 55417
    (612) 627-2387

School-University Partnerships
Richard Kobliner, College Counselor. Benjamin Cardozo High School, 5700 223rd Street, Bayside, NY 11364 (718) 631-7514
Science, Mathematics, and Technology Education
Dennis W. Cheek. New York State Department of Education, Rm 232 M ED, State Education Department, Albany, NY 12234 (518) 473-1759
Self-Directed Learning
Delmo Della-Dora. Department of Educational Leadership, California State University, Hayward, CA 94542 (415) 881-3962
Social Issues and Education
James T. Sears. University of South Carolina, Wardlaw 230, Columbia, SC 29208 (803) 777-6003
Staff Development
Debra Jagielski. Loyola University, School of Education, 820 North Michigan Avenue, Chicago, IL 60611 (312) 915-6034
Strategic Planning Network From Vision to Reality
Patricia R. Stelwagon. Berryessa Union School District, 1376 Piedmont Road, San Jose, CA 95132 (408) 923-1831
Teaching for Multiple Intelligences
David G. Lazear. Illinois Renewal Institute, 200 East Wood Street, Suite 200, Palatine, IL 60067 (708) 991-6300
Teaching Thinking
Robin Fogarty. Skylight Publishing, Inc., 200 East Wood Street, Suite 250, Palatine, IL 60067 (708) 991-6300
Understanding Educational Change
Martin Brooks. Shoreham Wading River Central School District, Route 25A, Shoreham, NY 11786 (526) 929-8500
Whole Language
Lenore Sandel. Hafstra University, Room 102, Mason Hall, Hempstead, NY 11550 (516) 560-5803

Kentucky Educational Television

Professional development seminars

Kentucky Educational Television (KET) Star Channel's Professional Development Seminars are developed by KET with input from Kentucky educators and the Kentucky Department of Education and are designed to help educators achieve the instructional goals of the Kentucky Education Reform Act. The seminars include advice from Kentucky educators, KDE officials, and nationally recognized experts in education reform along with actual footage from classrooms where strands of education reform are being implemented effectively. The seminars are delivered live from KET to every public school across the state. At every registered site, a seminar facilitator leads the sessions.

Enrichment and supplementary programs for students

Production, acquisition, and satellite delivery of instructional programming and accompanying teacher guides in language arts, math, science, social studies, foreign languages, fine arts, career education, economic and business education, health education, and personal development for pre-school through post-secondary students.

Advanced high school courses by satellite

The KET Star Channel's system delivers advanced high school courses to students in schools where previously the courses were not offered. These live, interactive courses are offered daily.

Electronic communications

KET-Net (Kentucky Educational Television Network) is an electronic communications network available to schools across the state. It is a way to add innovative classroom activities to the regular curriculum, to share ideas with educators in other schools, and to put students in touch electronically with other Kentucky students and experts in a variety of subjects. With a microcomputer, a modem, and the proper communications software, any school can "tap into" KET-Net.

Video rental library

Video resources on health/family life and parenting topics.

KET Education Division
600 Cooper Drive
Lexington, KY 40502-2296
(800) 432-0951

Kentucky Library Network

Information Sheet

The Kentucky Library Network (KLN) is a membership organization first incorporated in July, 1985. The Network is administered by the Kentucky Department for Libraries and Archives (KDLA).

The membership includes over 230 information providers of all types with a breakdown as follows:

- 50% public libraries,
- 20% academic libraries,
- 17% school libraries,
- 10% special libraries (e.g., business, health), and
- 03% consortia.

The goals of the Network are to

- Achieve resource sharing in the Commonwealth through:
  - Development and/or linking of bibliographic data bases and access tools,
  - Interlibrary loan of materials, and
  - Development of mechanisms for cooperative collection;
- Provide mechanisms for referral of information requests;
- Develop effective communication among all components of the Network;
- Promote development of network members or potential members by cooperating with other library and information organizations in the state; and
- Coordinate KLN activities with local, state, regional, and national information networks.

In the 1990-92 biennium, through support from the Kentucky legislature, KLN members received computer equipment configurations, consisting of a PC, internal modem, printer, and software, which allows their institutions to have access to the KLN database (currently 5.3 million holdings in all types of libraries). This Group Access Capability (GAC) enables KLN members to access electronically the nationwide interlibrary loan system (OCLC).

This computer base can also open access to all libraries regardless of size or location to the information resources of state government, commercial databases, federal government, private industry, academic research facilities, scientific institutions, and other information providers.

Instructional Material Resources for Making Connections

Publications: Books

Armstrong, Thomas. *In Their Own Way: Discovering and Encouraging Your Child's Personal Learning Style.* Los Angeles, CA: Jeremy P. Tarcher, Inc., 1987.

Association for Supervision and Curriculum Development. *Toward the Thinking Curriculum: Current Cognitive Research, 1989 ASCD Yearbook.* Alexandria, VA: Association for Supervision and Curriculum Development, 1989.

Bellanca, James. *Building a Caring, Cooperative Classroom.* Palatine, IL: IRI/Skylight Publishing, 1990.

Bradley, Marion. *What's Worth Teaching? Selecting, Organizing, and Integrating Knowledge.* Albany, NY: State University of New York Press, 1989.

Brownlie, Faye, Susan Close, and Linda Wingren. *Tomorrows Classroom Today: Strategies for Creating Active Readers, Writers, and Thinkers.* Markham, Ontario: Pembroke Publishers Limited, 1990.

Brusic, Sharon, et al. *An Overview of Mission 21: A Program Designed to Assist Teachers in Integrating Technology Into Their Present Curriculum Through a Problem-Solving Approach.* Blacksburg, VA: Virginia Polytechnic Institute, 1990.

Cohen, Elizabeth. *Designing Groupwork: Strategies for the Heterogeneous Classroom.* New York, NY: Teachers College Press, 1986.

Ellingsen, Robert. *Classroom of the 21st Century: Integrated Thematic Instruction.* Village of Oak Creek, AZ: Susan Kovalik and Associates, 1989.

Erb, Thomas, and Nancy Doda. *Team Organization: Promise — Practices and Possibilities.* Washington, DC: National Education Association, 1989.

Fogarty, Robin. *Designs for Cooperative Interactions.* Palatine, IL: IRI/Skylight Publishing, 1991.

Fogarty, Robin. *The Mindful School: How to Integrate the Curricula.* Palatine, IL: IRI/Skylight Publishing, 1991.

Fogarty, Robin, and James Bellanca. *Teach Them Thinking.* Palatine, IL: IRI/Skylight Publishing, 1986.

Katz, Lillian, and Sylvania Chard. *Engaging Children's Minds: The Project Approach.* Norwood, NJ: Ablex Publishing Corporation, 1990.

Kindrick, Karen, and Cynthia Black. *Adventures Down the Mississippi.* Village of Oak Creek, AZ: Susan Kovalik and Associates, 1990.

Kovalik, Susan. *ITI: The Model.* Village of Oak Creek, AZ: Susan Kovalik and Associates, 1992.

Kovalik, Susan. *Teachers Make the Difference with Integrated Thematic Instruction.* Village of Oak Creek, AZ: Susan Kovalik and Associates, 1986.

Lazear, David. *Seven Ways of Knowing.* Palatine, IL: IRI/Skylight Publishing, 1991.

Lazear, David. *Seven Ways of Teaching.* Palatine, IL: IRI/Skylight Publishing, 1991.

Lewis, Barbara. *The Kid's Guide to Social Action: How to Solve the Social Problems You Choose and Turn Creative Thinking into Positive Action.* Minneapolis, MN: Free Spirit Publishing Company, 1991.

Marzano, Robert. *A Different Kind of Classroom: Teaching with Dimensions of Learning.* Alexandria, VA: Association of Supervision and Curriculum Development, 1992.

Miller, Raymond, ed. *Issues in Integrative Studies.* San Francisco: CA: Association for Integrative Studies, 1982, 1983, 1984 / 85.

Northeast Foundation for Children. *A Notebook for Teachers: Making Changes in the Elementary Curriculum.* Greenfield, MA: Northeast Foundation for Children, 1987.

Northwest Educational Service District 189. *"Restructuring" Schools: Integrating the Curriculum.* Mount Vernon, WA: Northwest Educational Services District 189, 1989.

Reinhartz, Dennis and Judy Reinhartz. *Geography Across the Curriculum.* Washington, DC: National Education Association, 1990.

Richards, M.C. *The Public School and the Education of the Whole Person.* Philadelphia, PA: The Pilgrim Press, 1980.

Rick, Dorothy. *Mega Skills: How Families Can Help Children Succeed in School and Beyond.* Boston, MA: Houghton Mifflin Company, 1988.

Roopnarine, J., and J. Johnson. *Approaches to Early Childhood Education.* Columbus, OH: Merrill Publishing Company, 1987.

Shoemaker, Betty and Jean Eklund. *Integrative Education: A Curriculum for the Twenty-First Century.* Eugene, OR: Oregon School Study Council, 1989.

Short, Kathy and Carolyn Burke. *Creating Curriculum: Teachers and Students as a Community of Leaders.* Portsmouth, NH: Heinemann Publications, 1991.

Stevenson, Chris, and Judy Carr, eds. *Integrative Studies in the Middle Grades: Dancing through the Walls.* New York, NY: Teachers College Press, 1993.

Vars, G.F. *Interdisciplinary Teaching in the Middle Grades.* Columbus, OH: National Middle School Association, 1987.

Venalia, Carol. *Your Guide to Indoor Well-Being: Healing Environments.* Berkeley, CA: Celestial Arts, 1988.

Wassermann, Selma. *Serious Players in the Primary Classroom: Empowering Children Through Active Learning Experiences.* New York, NY: Teachers College Press, 1990.

Publications: Articles, Periodicals for Making Connections

Alverman, Donna. "The Discussion Web: A Graphic Aid for Learning across the Curriculum." *Reading Teacher*, October 1991: 92-99.

Aschbacker, Pamela. "Humanitas: A Thematic Curriculum." *Educational Leadership*. October, 1991: 16-19.

Charp, Sylvia. *The Journal: Technological Horizons in Education.* September 1992. Theme issue on curriculum integration.

Costa, Art. "What Human Beings Do When They Behave Intelligently and How They Can Become More So." *Developing Minds: A Resource Book for Teaching Thinking, Vol. 1.* Alexandria, VA: Association for Supervision and Curriculum Development, 1991.

Deake, Susan. "How Our Team Dissolved the Boundaries." *Educational Leadership*, October 1991: 47-49.

Doyle, Charles. "Nature in the Classroom: Local Resources Often Overlooked." *New Jersey Education Association Review*, September 1982: 48-49.

Gehrke, Natalie. "Explorations of Teachers' Development of Integrative Curriculums." *Journal of Curriculum and Supervision,* Winter 1991: 107-17.

Goldman, Eric and Teri Langan. "The Civic Achievement Award: Civic Learning for Adolescents through Research, Writing, and Community Service." *Civic Perspective*, Fall 1990: 7-11.

Jacobs, H.H. and J.H. Borland. "The Interdisciplinary Concept Model: Theory and Practice." *Gifted Child Quarterly*, Fall 1986.

Marzano, R.J., D. Pickering, and R. Brandt. "Integrating Instruction Programs Through Dimensions of Learning." *Educational Leadership*, 1990.

Meeth, L.R. "Interdisciplinary Studies: Integration of Knowledge and Experience." *Change*, Vol. 10: 6-9, 1978.

Perkins, D.N. "Educating for Insight." *Educational Leadership*, October 1991: 4-8.

Rubino, Ann. "The Science/Language Connection: Why to Make it...How to Do It (In the Classroom)." *Reading Teacher*, November, 1991: 248-49.

Shoemaker, B. "Education 2000: Integrated Curriculum." *Kappan*, June 1991: 793-797.

Vars, Gordon. "Designs for General Education: Alternative Approaches to Curriculum Integration." *Journal of Higher Education*, March/April 1982: 216-26.

Other Resources for Making Connections

Colorado Middle Level Interdisciplinary Education Center (CMLIEC)
Interdisciplinary instructional units are available for a modest fee.
CMLIEC Middle School, McKee Hall, Room 213, Greeley, CO 80639 (303) 351-2369

KET Series for Educators and Students
Bringing Integrated Curriculum into the Elementary Classroom (for teachers)
You Figure It Out! (for students) KET, 600 Cooper Drive, Lexington, KY 40502

The Mailbox: Idea Magazine
The Education Center, Inc. 1607 Battleground Avenue, P.O. Box 9753, Greensboro, NC 27429-0753

Odyssey, Faces, Cobblestone and Calliope
Cobblestone Publishing, Inc., 30 Grove Street, Peterborough, NH 03458 (603) 924-7209

Instructional Material Resources for Multicultural Education

Programs

Annual Multicultural Education "Connections" Conference

Offered by the Kentucky Department of Education through the Department's Multicultural Opportunities Branch. For information contact: the Multicultural Opportunities Branch, Division of Professional Development, Kentucky Department of Education, (502) 564-6916.

Publications: Books

Baker, Gwendolyn. *Planning and Organizing for Multicultural Instruction.* Reading, MA: Addison-Wesley Publishing Co., 1983.

Banks, James A. *Teaching Strategies for Ethnic Studies, Fifth Edition.* Boston , MA: Allyn and Bacon, Inc., 1991.

Banks, James A. and Cherry A McGee Banks. *Multicultural Education: Issues and Perspectives, Second Edition.* Boston, MA: Allyn and Bacon, Inc., 1993.

Baruth, Leroy G., and M. Lee Manning. *Multicultural Education of Children and Adolescents*. Boston, MA: Allyn and Bacon, Inc., 1992.

Ramsey, Patricia, Edwina Vold, and Leslie Williams. *Multicultural Education*. Washington, DC: Library of Congress, 1989.

Tiedt, Pamela, and Iris Tiedt. *A Handbook of Activities, Information, and Resources: Third Edition*. Boston, MA: Allyn and Bacon, Inc., 1990.

Publications: Articles

Dimidjian, Victoria Jean. "Holidays, Holy Days, and Wholly Dazed: Approaches to Special Days." *Young Children*. September 1989: 70-75.

Publications: Periodicals

Multicultural Review
Greenwood Publishing Group, Inc., 88 Post Road W., P.O. Box 5007, Westport, CT 06881-5007. Quarterly.

Teaching Tolerance
400 Washington Avenue, Montgomery, AL 36104. Free to educators.

Third World Resources
464 19 Street, Oakland, CA 94612-2297. Quarterly.

Videos

Appalshop video collection.
Appalshop, P.O. Box 743, Whitesburg, KY 41858 (606) 633-0108

Black and White America; Kids and Race: Work it Out; Pockets of Hate; Racism in America; The Asianization of America; The Next Minority: White Americans. Films for the Humanities and Sciences, Inc., P. O. Box 2053, Princeton, NJ 08543.

Eyes on the Prize I & II (Fourteen part series)
1987-1990. Public Broadcasting System Video, 1320 Braddock Place, Alexandria, VA 22314-1698 (800) 344-3337

Professional Associations for Multicultural

National Alliance of Black School Educators
2816 Georgia Avenue NW, Washington, DC 20001 (202) 483-1549

National Black Child Development Institute, Inc.
1463 Rhode Island Avenue NW, Washington, DC 20005 (202) 387-1281

National Organization for Women
1000 16th Street, NW, Suite 700, Washington, DC 20036 (202) 331-0066

National Women's History Project
7738 Bell Road, Windsor, CA 95492-8515 (707) 838-6000

Resource Center for Nonviolence
515 Broadway, Santa Cruz, CA 95060 (408) 423-1626

Women's International League for Peace and Freedom
1213 Race Street, Philadelphia, PA 19107-1691 (215) 563-7110

Instructional Material Resources for Technology

Programs

Assistive Technology Users Group (ATUG)

A bulletin board system started by the Kentucky Department for the Blind with a grant from the National Institute on Disability and Rehabilitation Research (NIDRR). Initially intended specifically for persons with blindness and other visual impairments, it now includes KATSNET, the bulletin board of the Kentucky Assistive Technology Service (KATS) Network. There are no on-line charges and the system can be accessed with a toll-free number from anywhere within Kentucky. For information contact: Assistive Technology Service, Department for the Blind, 1900 Brownsboro Road, Louisville, KY 40206 (502) 879-6439. For On-line Access: (800) 242-0490, (502) 894-0022, (502) 894-0393.

Kentucky Education Television Network (KET-Net)

An electronic communications network available to schools across the state. It is a way for educators to add innovative classroom activities to their regular curriculum, to share ideas with other educators across the state, and to put their students in touch with other Kentucky students and experts in a wide variety of subjects electronically. With a microcomputer, a modem, and the proper communications software, any school can "tap into" KET-Net. For information contact: Chela Kaplan, KET, 600 Cooper Drive, Lexington, KY 40502 (800) 432-0951 ext. 7265. For on-line access: (606) 281-9452.

National Distance Learning Center (NDLC)

An electronic, on-line computer database of over 2,100 individual listings for educational programming and materials that is accessible 24 hours a day to anyone with a personal computer and modem. It operates out of Owensboro, KY in partnership with the US Federal Government as a public service dedicated to reducing the barriers between the users and providers of educational programming ad materials. For information contact: National Distance Learning Center, 4800 New Hartford Road, Owensboro, KY 42303. (502) 686-4550. For on-line access: (502) 686-4555 [Connections are supported to 2400 baud (N-8-1)].

Publications: Books

Information Power: Guidelines for School Library Media Programs. Chicago, IL: American Library Association and the Association for Educational Communications and Technology, 1988.

Kentucky Department of Education and Jefferson County Public Schools. *Technology in Education: Key Ideas for Kentucky Educators*. Louisville, KY: Jefferson County Public Schools, 1990.

Kercher, L. *Integrating Technology: Strategies*. Laramie, WY: University of Wyoming.

Martin, M.J. *Instructional Videotaping: A Teacher's Guide for Making Instructional Videotapes*. Cape Canaveral, FL: Management Training Consultants, Inc., 1992.

Merrill, P., K. Hammons, M. Tolman, L. Christensen, B. Vincent, and P. Reynolds. *Computers in Education*. (2nd ed.). Boston, MA: Allyn and Bacon, 1992.

Ryba, K. and B. Anderson. *Learning with Computers: Effective Teaching Strategies*. Eugene, OR: International Society for Technology in Education, 1990.

Thornburg, D. *Education, Technology, and Paradigms of Change for the 21st Century*. San Carlos, CA: Starsong Publications, 1991. Available from EdTech Books, 1561 Laurel Street, Suite A, San Carlos, CA 94070.

Publications: Articles for Technology

Ray, Doris. "Technology and Restructuring Part I: New Education Directions." *The Computing Teacher*. March, 1991: 9-20.

Ray, Doris. "Technology and Restructuring Part II: New Education Directions." *The Computing Teacher*. April, 1991: 8-12.

Publications: Periodicals

Educational Technology
  Educational Technology Publications, Inc., 720 Palisade Avenue, Englewood Cliffs, NJ 07632
Electronic Learning
  Scholastic, Inc., 351 Garver Road, Monroe, OH 45050-2700
Journal of Research on Computing in Education
  International Society for Technology in Education (ISTE), 1787 Agate Street, Eugene, OR 97403-1923
Media & Methods
  American Society of Educators, 1429 Walnut Street, Philadelphia, PA 19102 (215) 563-3501 (215) 563-6005
Tech Trends
  Association for Educational Communications and Technology, 1025 Vermont Avenue NW, Washington, DC 20005
Technology & Learning
  Peter Ki, Inc., 2451 E River Road, Dayton, OH 45439
The Computing Teacher
  International Society for Technology in Education (ISTE), 1787 Agate Street, Eugene, OR 97403-1923 (503) 346-4414

Professional Organizations

Association for Educational Communications and Technology
  1025 Vermont Avenue NW, Suite 820, Washington, DC 20005
International Society for Technology in Education
  1787 Agate Street, Eugene, OR 97403-1923
Kentucky Assistive Technology Service Network
  Coordinating Center, 427 Versailles Road, Frankfort, KY 40601
Kentucky Association of Technology Coordinators
  238 Bowling Green Road, Scottsville, KY 42164

Professional Evaluations for Instructional Resources

This section lists references which review instructional resources. The school library media specialist can help you locate these publications and assist you with the evaluation and selection process. The code below is used to represent the type of resource reviewed.

AV- Audiovisual (audiocassettes, films, filmstrips, videocassettes, etc.)
B- Books
PB- Professional Books
P- Periodicals
PJ- Professional Journals
S-Software
CD-ROM- Compact Disc-Read Only Memory

Publications: Books of Professional Evaluations

A to Zoo: Subject Access to Children's Picture Books. 3rd ed., $44.95. Bowker, 1989. (ISBN 0-8352-2599-2) (PreK-Grade 2) **B**

AAAS Science Book List, 1978-1986. $25.00, AAAS, 1986. (ISBN-0-87168-313-6) (Grades 6-12) **B, PB**

Accept Me as I Am: Best Books of Juvenile Non-Fiction on Impairments and Disabilities. $34.95. Bowker, 1985. (ISBN-0-8352-1974-7) (PreK-Grade 12) **B**

Adventuring With Books: A Booklist for PreK-Grade 6. 9th ed. $16.50, paper. NCTE, 1989. (ISBN-0-8141-0078-3) (PreK-Grade 6) **B**

America A Story: Historical Fiction for Secondary Schools. $15.00, paper. ALA, 1988. (ISBN-0-8389-0492-0) (Grades 6-12) **B**

American History For Children and Young Adults: An Annotated Bibliography Index. $32.50. Libs. Unl., 1990. (ISBN 0-87287-731-0) (Grades K-12) **B**

Best Books for Children: Preschool through Grade 6. 4th ed. $44.95. Bowker, 1990. (ISBN 0-8352-2668-9) (PreK-Grade 6) **B**

Best Books for Junior High Readers. $44.95. Bowker, 1991. (ISBN 0-8352-3020-1) (Grades 7-9) **B**

Best Books for Senior High Readers. $44.95. Bowker, 1991. (ISBN 0-8352-3021-X) (Grades 9-12) **B**

Best Encyclopedias: A Guide to General and Specialized Encyclopedias. $39.50. Oryx Pr., 1986. (ISBN 0-89774-171-4) (PreK-Grade 12) **B**

The Best: High/Low Books for Reluctant Readers. $12.50, paper. Libs. Unl., 1990. (ISBN 0-87287-532-6) (Grades 3-12) **B**

Best of Bookfinder - See *The Bookfinder*

The Best Science Books and A-V Materials for Children. $20.00. AAAS, 1988. (ISBN 0-87168-316-4) (Grades K-9) **AV, B**

Beyond Picture Books: A Guide to First Readers. $39.95. Bowker, 1989. (ISBN 0-8352-2515-1) (Grades 1-3) **B**

Book Bait: Detailed Notes on Adult Books Popular with Young People. 4th ed. $12.00, paper. ALA, 1988. (ISBN 0-8389-0491-2) (Grades 7-9) **B**

The Bookfinder: When Kids Need Books, Volume 4: Annotations of Books Published 1983 Through 1986. $34.94, paper. Am. Guidance, 1989. (ISBN 0-913476-51-X) (PreK-Grade 12) See *Best of Bookfinder* **B**

Books for Children to Read Alone: A Guide for Parent and Librarians. $39.95. Bowker, 1988. ISBN 0-8352-2346-9) (PreK-Grade 3) **B**

Books for the Gifted Child, Volume 2. $39.95. Bowker, 1988. (ISBN 0-8352-2467-8) (PreK-Grade 6) **B**

Books for You: A Booklist for Senior High Students. 10th ed. $13.95, paper. NCTE, 1988 (ISBN 0-8144-0364-2) (Grades 10-12) **B**

Books Kids Will Sit Still For: The Complete Read-Aloud Guide. 2nd ed. $34.95. Bowker, 1990. (ISBN 0-8352-3010-4) (PreK-Grade 6) **B, PB**

Books to Help Children Cope With Separation and Loss: An Annotated Bibliography. Volume 3. $39.95. Bowker, 1989. (ISBN 0-8352-2510-0) (PreK-Grade 11) **B, PB**

Children's Catalog. 16th ed. (Includes 4 annual supplements) $72.00. Wilson, 1986. (ISBN 0-8242-0743-2) (PreK-Grade 7) **B, PB**

Choosing Books for Children: A Commonsense Guide. Rev. ed. $9.95, paper. Delta, 1990. (ISBN 0-385-30108-1) (PreK-Grade 7) **B, PB, PJ**

Current Issues Resource Builder: Free and Inexpensive Materials For Librarians and Teachers. $19.95, paper. McFarland & Co., 1989. (ISBN -89950-388-8) (Grades K-12) **AV, B, P, S**

The Elementary School Library Collection: A Guide To Books and Other Media. 17th ed. $99.95. Brodart, 1990. (ISBN 0-87272-094-2) (PreK-Grade 6) **AV, B, P, PB, S**

English/Language Arts Curriculum Resource Handbook. Kraus International Publications, 1992. **B,AV, S**

Eyeopeners! How To Choose and Use Children's Books and Real People, Places, and Things. $9.95, paper. Viking Penguin, 1988. (ISBN 0-14-04680-7) (Grades K-9) **B**

Fantasy Literature for Children and Young Adults: An Annotated Bibliography. 3rd ed. $39.95. Bowker, 1989. (ISBN 0-8352-2347-7) (Grades 3-12) **B, PB**

For Reading Out Loud! A Guide to Sharing Books With Children. Rev. ed. $16.95. Delacorte, 1988. (ISBN 0-385-29660-6) (PreK-Grade 8) **B**

Growing Pains: Helping Children Deal With Everyday Problems Through Reading. $17.50, paper. ALA, 1988. (ISBN 0-8389-0469-6) (PreK-Grade 8) **B**

Guide To Reference Books For School Media Center. 3rd ed. $36. Libs. Unl., 1986. (ISBN 0-87287-545-8) (Grades K-12) **B**

High Interest--Easy Reading: For Junior and Senior High School Students. 5th ed. $7.95, paper. 805-8) (Grades 6-12) **AV, B, P, S**

High/Low Handbook: Encouraging Literacy in the 1990's. 3rd ed. $39.95. Bowker, 1990. (ISBN 0-8352-2804-5) (Grades 7-12) **B, P, S**

Junior High School Library Catalog. 6th ed. (Includes 4 annual supplements) $105.00. Wilson, 1990. (ISBN 0-8242-0799-8) (Grades 6-9) **B**

Literature-Based Reading: Children's Books and Activities To Enrich the K-5 Curriculum. $29.95, paper. Oryx Pr., 1990. (ISBN 0-89774-562-0) (Grades K-5) **B**

Literature For Today's Young Adults. 3rd ed. $29.95. Scott Foresman. 1989. (ISBN 0-673-38400-4) (Grades 7-12) **B**

Magazines for Children: A Guide For Parents, Teachers, and Librarians. 2nd ed. $20.00, paper. ALA, 1991. (ISBN 0-8389-0552-8) (PreK-Grade 8) **P**

Magazines for Libraries. 6th ed. $124.95. Bowker, 1989. (ISBN 0-8352-2632-8) (PreK-Grade 12) **P, PJ**

Magazines for Young People. 2nd ed. $49.95. Bowker, 1991. (ISBN 0-8352-3009-0) (PreK-Grade 12) **P, PJ**

Mathematics Curriculum Resource Handbook. Kraus International Publications, 1992. **AV, B, S**

Mother Goose Comes First: An Annotated Guide To The Best Books and Recording For Your Preschool Child. $14.95, paper. H. Holt & Co., 1990. (ISBN 0-8050-1001-7) (PreK-Grade 1) **AV, B**

The Museum of Science and Industry Basic List of Children's Science Books. $11.95, paper. 1988. (ISBN 0-8389-0499-8) (PreK-Grade 9) **B, P, PB, PJ**

Non-Fiction for Young Adults: From Delight to Wisdom. $32.50, paper. Oryx Press, 1990. (ISBN 0-89774-555-8) (Grades 7-12) **B**

Only the Best, 1985-1989: The Cumulative Guide To Highest-Rated Educational Software, Preschool - Grade 12. $49.95. Bowker, 1989. (ISBN 0-8352-2851-7) (PreK-Grade 12) **S**

Only The Best, 1990: The Annual Guide to Highest-Rated Educational Software, Preschool-Grade 12. $26.95. Bowker, 1989. (ISBN 0-8352-2766-0) (PreK-Grade 12) **S**

Only the Best, 1991: The Annual Guide to Highest-Rated Educational Software, Preschool - Grade 12. $29.95. Bowker, 1990. (ISBN 0-8352-2952-1) (PreK-Grade 12) **S**

Picture Books for Children. 3rd ed., $25.00, paper. ALA, 1990. (ISBN 0-8389-0527-7) (PreK-Grade 8) **B**

Recommended Reference Books For Small and Medium-Sized Libraries and Media Centers. $37.00. Libs. Unl., 1990 (ISBN 0-87287-826-0) (N/A) **B**

Reference Books for Young Readers: Authoritative Evaluations of Encyclopedias, Atlases, and Dictionaries: $49.95. Bowker, 1988. (ISBN 0-8352-2366-3) (PreK-Grade 12) **B**

The School Librarian's Sourcebook. $34.95. Bowker, 1990. (ISBN 0-8352-2711-1) **AV, PB, PJ, S**

Science and Technology In Fact and Fiction: A Guide to Children's Books. $35.00. Bowker, 1990. (ISBN 0-8352-2708-1) (PreK-Grade 6) **B, PB**

Science and Technology In Fact and Fiction: A Guide to Young Adult Books. $35.00. Bowker, 1990. (ISBN 0-8352-2710-3) (Grades 5-12) **B**

Science Curriculum Resource Handbook. Kraus International Publications, 1992. **AV, B, S**

Senior High School Library Catalog. 13th ed. (Includes 4 annual supplements) Wilson, 1992. (ISBN 0-8242-0831-5) (Grades 9-12) **B**

Social Studies Curriculum Resource Handbook. Kraus International Publications, 1992. **AV, B, S**

Substance Abuse: A Resource Guide For Secondary Schools. $28.50. Libs. Unl., 1991. (ISBN 0-87287-805-8) (Grades 6-12) **AV, B, P, S**

Your Reading: A Booklist For Junior High and Middle School Students. 7th ed. $13.95, paper. NCTE, 1988. (ISBN 0-8141-5939-7) (Grades 5-9) **B**

Publications: Periodicals

Book Links. Connecting Books, Libraries, and Classrooms. Bimonthly. Booklist Publications, 50 E. Huron Street, Chicago, IL 60611. **P**

Book Report: The Journal For Junior and Senior High School Librarians. Bimonthly September-May. $39.00. Linworth Publishing, Inc., 480 E. Wilson Bridge Road, Suite L, Worthington, OH 43085 **AV B, PB, S, CD-ROM**

Booklist. Twice monthly September-June (except monthly, July and August) $56.00. American Library Association, 50 E. Huron Street, Chicago, IL 60611 **AV, B, S**

Bulletin of The Center For Children's Books. Monthly (except August). $24.00. The University of Illinois Press, 54 E. Gregory Drive, Champaign, IL 61820 **B**

CD-ROM Librarian. Monthly (except for a combined issue July/August). $79.50. Meckler Corporation, 11 Ferry Lane West, Westport, CT 06880 **CD-ROM**

Children's Video Review Newsletter. Bimonthly June-April. $36.00. *Children's Video Review Newsletter*, 100 Lena Court, Grass Valley, CA 95949-9979 **AV**

The Computing Teacher. Monthly August-May (except for combined issues August/September and December/January) $47.00. International Society for Technology in Education (ISTE), 1787 Agate Street, Eugene, OR 97403-1923 **S**

Electronic Learning. Monthly September-April (except for combined issues November/December and May/June) $23.95. Scholastic, Inc., 351 Garver Road, Monroe, OH 40505-2700 **S**

Five Owls: A Publication for Readers Personally and Professionally Involved in Children's Literature. Five times a year. 2004 Sheridan Avenue S, Minneapolis, MN 55405 **B**

The Horn Book Magazine. Six times a year in January, March, May, July, September, and November. $38.00. The Horn Book, Inc., 14 Beacon Street, Boston, MA 02108 **B**

The Horn Book Guide to Children's and Young Adult Books. Twice a year in March and September. $50.00 (One-year subscription to both *The Guide* and *The Horn Book Magazine*.) The Horn Book, Inc., 14 Beacon Street, Boston, MA 02108 **B**

Incider/A+. Monthly. $27.97. IDG Communications, 80 Elm Street, Peterborough, NH 03458 **S**

Kirkus Reviews. Twice Monthly. $75.00. 200 Park Avenue S, New York, NY 10003 **B**

MacWorld: The Macintosh Magazine. Monthly. $30.00 Macworld Communications, Inc., 501 Second Street, San Francisco, CA 94107 **S, CD-ROM**

School Library Journal. Monthly, January-December. $63.00. P.O. Box 1978, Marion, OH 43305-1978 **AV, B, PB, P, S**

Science Books and Films. Monthly (except January, July, and August). $35.00. American Association for the Advancement of Science, 1333 H. Street., Washington, DC, 20005 **AV, B, PB, S**

Technology and Learning. (Formerly *Classroom Computer Learning*). Monthly (except June, July, August, and December). $24.00 Peter Li, Inc., 2451 E. River Road, Dayton, OH 45439 **S**

TnT: Tips and Titles and Books: Grades K-8. Jan Lieberman, 121 Buckingham Drive, #57, Santa Clara, CA 95051

Voice of Youth Advocates (VOYA). Bimonthly April-February. $32.50. Scarecrow Press, Inc., 52 Liberty Street, Metuchen, NJ 08840 **AV, B, PB**

Wilson Library Bulletin. Monthly (except July and August). $46.00. The H.W. Wilson Company, 950 University Avenue, Bronx, NY 10452 **AV, B, PB, P, S, CD-ROM**

Professional Organizations and Resources

American Association for the Advancement of Science (AAAS)
Marketing Department, 1333 H Street NW, Washington, DC 20005

American Guidance Service, Inc.
Publisher's Building, Circle Pines, MN 55014-1796.

American Library Association (ALA)
50 E. Huron Street, Chicago, IL 60611 (800) 545-2433
Divisions: American Association of School Librarians, Association for Library Service to Children, Library and Information Technology Association, Young Adult Services Division.

R.R. Bowker Company
Order Department, P.O. Box 31, 121 Chanlon Road, New Providence, NJ 07974

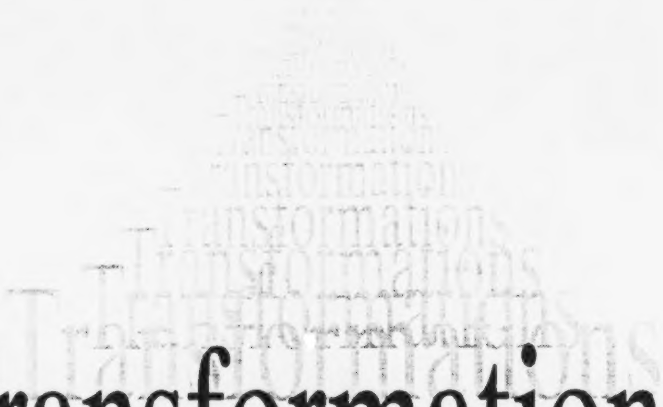
Brodart Company
500 Arch Street, Williamsport, PA 17705

Delacorte Press
666 Fifth Avenue, New York, NY 10103

Delta Books
666 Fifth Avenue, New York, NY 10103

Kentucky Library Association (KLA)
Tom Underwood, Executive Director. Twilight Trail, Frankfort, KY 40601

Kentucky School Media Association (KSMA)
Sally Livingston, President. 116 Heady Avenue, Louisville, KY 40207
Kraus International Publications
A Division of The Kraus Organization Limited, Route 100, Millwood, NY 10546
(800) 223-8323
Libraries, Unlimited
P.O. Box 3988, Englewood, CO 80155-3988
McFarland & Company, Inc.
Publishers, Box 611, Jefferson, NC 28640
National Council of Teachers of English (NCTE)
1111 Kenyon Road, Urbana, IL 61801
Oryx Press
2214 North Central Avenue at Encanto, Phoeniz, AZ 85004-1483
Scott, Foresman, and Company
1955 Montreal Road, Tucker, GA 30084
Society of School Librarians International (SSLI)
620 West Roosevelt Road, Suite B2, Wheaton, IL 60187
Viking Penguin
375 Hudson Street, New York, NY 10014-3657
H.W. Wilson Company
950 University Avenue, Bronx, NY 10452.



Transformations:

Resources

Community Resources

Community Resources

The involvement of community resources in educational programs can add a new and exciting dimension to the learning process. Students interact with adults and are provided opportunities to become productive members of their communities; adults benefit accordingly by helping students learn. Student involvement in the community provides them with the following:

- opportunities to demonstrate competence,
- a social connection to people and to a place,
- avenues to explore a variety of careers, and
- enhanced self-esteem and sense of empowerment by "giving something back."

Community members can become involved with in-school projects that will improve the quality of instruction offered to students while providing the community with the following:

- renewal and enthusiasm;
- opportunities to become mentors to the next generation of leaders, taxpayers, and consumers;
- enhanced school-community good will;
- increased level of service; and
- a vested interest in the success of local young people.

Integrating community resources into the school curriculum is more than simply offering extracurricular activities. It expands the learning environment beyond the four walls of the traditional classroom to make learning more relevant for students.

Kentucky Education Reform Act (KERA) called for new approaches to traditional classroom routines and asked educators to consider alternatives to standard teaching methods. KERA also challenged teachers to give students opportunities to apply in real-life settings the information acquired in books and encouraged students to become responsible members of their communities. These KERA initiatives can be accomplished by involving communities and their wealth of resources in the local education process. Community interaction benefits both students and community members by providing them opportunities to give and receive assistance.

Ways to Utilize Community Resources

Field studies
Technical expertise
Demonstrations
Internship opportunities
Co-op opportunities
Career days
On-the-job training
Incentives and recognitions
Oral histories

Speakers
Free materials
Mentors
Job shadowing
Scholarships
Donations
Business partnership programs
Mini-courses

Suggestions for Organizing Resources

District Level - An individual in the central office could be responsible for initiating and coordinating a comprehensive list of community resources and for scheduling projects and speakers. This person could assist the classroom teacher by initiating and developing contacts for school/community partnership projects.

School Level - An advisory committee in each school could survey parents and members of the community regarding areas of expertise and willingness to participate as resources for classroom teachers. Directories of these resources could be compiled for each building. The advisory committee could work either with or in lieu of a district coordinator.

Database - In the central office or in a school technology lab, a comprehensive inventory of individuals, organizations, and businesses in the community willing to share skills, present programs, or otherwise get involved should be kept current. The database could contain the following fields:

- Category (e. g., civil, business/industry, environmental)
- Content area
- Developmental level
- Type of presentation (e.g, lecture, demonstration, mult-media, field study)
- Multiple intelligences for which most appropriate
- Academic expectations addressed

Framework for Creating Community Resource Directory

The suggestions which follow provide categories for organizing a local database. A sampling of possible resources is provided with each category. Each community and locality will have resources unique to their area.

Agribusiness Resources

American Dairy Association of Kentucky
3901 Atkinson Drive, Suite 115, Louisville 40218 (502) 451-3328
Dairymen Inc.
10140 Linn Station Road, Louisville 40223 (502) 426-6455
Kentucky Farm Bureau Federation
9201 Bunsen Parkway, P.O. Box 20700, Louisville 40250-0700 (502) 495-5000
Kentucky Feed and Grain Association
2545 Weisenberger Road, P.O. Box 215, Midway 40347 (606) 254-0294
Kentucky Pork Producers Association
615 North Mulberry Street, Elizabethtown 42701 (502) 737-5665
Kentucky Quarter Horse Association
4403 Glenarm Road, Crestwood 40014 (502) 241-5962

Kentucky State Horticultural Society
University of Kentucky, Agri Science Center North, #N308, Lexington 40546
(606) 257-3352
Kentucky Thoroughbred Association, Inc.
1718 Alexandria Drive, P.O. Box 4040, Lexington 40544 (606) 278-6004
Kentucky Veterinary Medical Association
410 West Vine Street, P.O. Box 12737, Lexington 40583-2737 (606) 233-0062
Kentucky Walking Horse Association
1445 Richmond Road, P.O. Box 522, Lancaster 40444 (606) 792-4141
Producers Livestock Marketing Association
1048 East Main Street, Louisville 40206 (502) 587-0945
Tobacco Institute
10101 Linn Station Road No. 525, Louisville 40223 (502) 426-6927

Other Resources

Botanical gardens
Farm equipment and supply businesses
Farms (e.g., locally owned, university farms, horse farms)
Landscaping and nursery businesses

Business/Industry Resources

American Automobile Association Kentucky
435 East Boardway, P.O. Box 1113, Louisville 40202 (502) 582-3311
Associated Builders & Contractors, Inc.
425 West Lee Street, Louisville 40208 (502) 637-6531
Associated General Contractors of Kentucky, Inc.
415 West Main Street, P.O. Box 457, Frankfort 40602 (502) 223-8845
Associated Industries of Kentucky
415 West Main, Frankfort 40601 (502) 875-5867
Association of Professional Businesswomen
Executive Park, Suite 209, P.O. Box 34484, Louisville 40232 (502) 897-5158
Better Business Bureau
Better Business Building, 844 South 4th Street, Louisville 40203 (502) 583-1492
Bluegrass Black Business Association
P.O. Box 2206, Lexington 40595 (606) 299-8111
Kentucky Bar Association
514 West Main Street, Frankfort 40601-1883 (502) 564-3795
Kentucky Chamber of Commerce
P.O. Box 817, Frankfort 40602 (502) 695-4700
Kentucky Society of Professional Engineers
1600 Democrat Drive, Frankfort 40601 (502) 695-5680
Kentucky State AFL-CIO
340-1 Democrat Drive, Frankfort 40601 (502) 695-6172

Kentucky State Racing Commission
Kentucky Horse Park, 4063 Iron Works Pike, P.O. Box 1080, Lexington 40588
(606) 254-7021
Small Business Administration
600 Dr. Martin Luther King Jr Pl, Rm 188, Louisville 40202 (502) 582-5971

Other Resources

Local factories and industries
Local merchants
Local professionals
Local service providers
Local utilities
State, local, and public agencies

Civic/Altrustic Resources

American Legion
970 South 4th Street, P.O. Box 2123, Louisville 40201 (502) 587-1414
American Red Cross
318 Washington Street, Frankfort 40601 (502) 223-1795
Boy Scouts of America
824 Phillips Lane, P.O. Box 36273, Louisville 40233 (502) 361-2624
Girl Scout Council, Inc.
1325 South 4th Street, P.O. Box 32335, Louisville 40232 (502) 636-0900
Kentucky Commission on Women
614-A Shelby Street, Frankfort 40601 (502) 564-6643
Kentucky Extension Homemakers Association
University of Kentucky, Scovell Hall Room 203, Lexington 40546-0064 (606) 257-3888
Kentucky Federation of Women's Clubs
1228 Cherokee Road, Louisville 40204 (502) 451-8435
Kentucky Jaycees
822 Phillips Lane, P.O. Box 17378, Louisville 40217 (502) 366-6118
Kentucky League of Women Voters
P.O. Box 87, Hopkinsville 42241-0087 (502) 885-3928
Kentucky-Tennessee District Kiwanis
1474 Ninevah Road, Frankfort 40601 (502) 223-7034
Rotary International, District 6710
2707 Breckenridge Street, Owensboro 42303 (502) 684-3200
State YMCA of Kentucky
407 Wapping Street, P.O. Box 577, Frankfort 40602 (502) 227-7028
United Nations Association
132 Wildwood Lane, Anchorage 40223 (502) 425-0619
United Way of Kentucky
334 East Broadway, P.O. Box 4653, Louisville 40204 (502) 589-6897

Other Resources

Food pantries/soup kitchens
Garden clubs
Homeless shelters
Salvation Army

Cultural Resources

Kentucky Arts Council
31 Fountain Place, Frankfort 40601 (502) 564-3757
Kentucky Center for the Arts
5 Riverfront Plaza, Louisville 40202 (502) 562-0100 (800) 283-7777
Kentucky Guild of Artists and Craftsmen
128 Main Street, P.O. Box 291, Berea 40403 (606) 986-3192
Kentucky Heritage Council
300 Washington Street, Frankfort 40601 (502) 564-7005
Kentucky Historical Society
Broadway at St. Clair Mall, P.O. Box H, Frankfort 40602 (502) 564-3016
Kentucky Humanities Council
417 Clifton Avenue, University of Kentucky, Lexington 40508-3406 (606) 257-5932
Kentucky Opera
631 South 5th Street, Louisville 40202 (502) 584-4500
National Association for the Advancement of Colored People
501 High Street, Room 904, Frankfort 40602 (502) 564-3601
Office of Historical Properties
Berry Hill Mansion, Frankfort 40601 (502) 564-3000
Paramount Arts Center
P.O. Box 1546, Ashland 41105-1546 (606) 324-3175
Wickliffe Mounds
P.O. Box 155, Wickliffe 42087 (502) 335-3681

Museums

Adsmore Museum
304 North Jefferson, Princeton 42445 (502) 365-3114
American Saddle Horse Museum
4093 Iron Works Pike, Lexington 40507 (606) 259-2746
Behringer-Crawford Museum
1600 Montague Road, Devou Park, P.O. Box 67, Covington 41012 (606) 491-4003
Cross & Crucifix Museum
815 East Market, Lousiville 40201 (502) 584-2826
Headley-Whitney Museum
4435 Old Frankfort Pike, Lexington 40510 (606) 255-6653
J. B. Speed Art Museum
2035 South 3rd Street, Louisville 40201-2600 (502) 636-2893
Kentucky Aviation Museum
Bowman Field, Louisville 40202 (502) 451-7858

Kentucky Derby Museum
704 Central Avenue, Louisville 40201 (502) 637-1111
Kentucky Railway Museum
P.O. Box 240, New Haven 40051 (800) 272-0152
Lexington Children's Museum
401 West Main Street, Victorian Square, Lexington 40507 (606) 258-3253
Locust Grove Historic Home Museum
561 Blankenbaker Lane, Louisville 40202 (502) 897-9845
Metropolitan Children's Museum
727 West Main, Louisville 40202 (502) 449-3383
Museum of History and Science
727 West Main Street, Louisville 40202 (502) 561-6100
Museum of the American Quilter's Society
P.O. Box 3290, Paducah 42001 (502) 898-7903
National Museum of the Boy Scouts of America
Murray State University, Murray 40271 (502) 762-3383
Nostalgia Station Toy Museum & Train Shop
279 Depot, Versailles 40383 (606) 873-2497
Oldenberg Brewery & Entertainment Complex
I-75 at Buttermilk Pike, Ft. Mitchell 41017 (606) 341-2804
Portland Museum
2308 Portland Avenue, Louisville 40202 (502) 776-7678

Other Resources

Art galleries and museums
Cemeteries
Ethnic restaurants
Performing arts groups
State agencies
Theatres

Educational Resources

American Printing House for the Blind
1839 Frankfort Avenue, Louisville 40218 (502) 895-2405
Arnim D. Hummel Planetarium
Eastern Kentucky University, Richmond 40475 (606) 622-1547
Carnegie Center for Learning and Literacy
251 West Second Street, Lexington 40511 (606) 254-4175
Council on Higher Education
1050 U.S. 127 South, Suite 101, Frankfort 40601 (502) 564-3553
Cumberland Gap National Historical Park
P.O. Box 1848, Middlesboro 40965 (606) 248-2817
Department for Libraries & Archives
300 Coffee Tree Road, P.O. Box 537, Frankfort 40602-0537 (502) 875-7000

Department of Travel Development
Capital Plaza Tower, P.O. Box 2011, Frankfort 40602-2011 (502) 564-4930
Georgetown College Planetarium
Georgetown College, Georgetown 40324 (502) 863-8436
Golden Pond Planetarium
Tennessee Valley Authority, Land Between the Lakes, Golden Pond 42211-9001
(502) 924-5602 ext. 238
Governor's Commission on Literacy
1100 U.S. 127 South, Frankfort 40601 (502) 564-4062
Hardin Planetarium
Western Kentucky University, Bowling Green 42101 (502) 745-4044
Junior Achievement of Kentuckiana
8911 Shelbyville Road, P.O. Box 24403, Louisville 40224 (502) 425-8833
Kentucky Community Education
1705 Capital Plaza Tower, 500 Mero Street, Frankfort 40601 (502) 564-6117
Kentucky Council on Economic Education
203 East Jefferson Street, Louisville 40202 (502) 584-2100
Kentucky Retired Teachers' Association
3901 Atkinson Drive, Number 111, Louisville 40218 (502) 459-8125
Mammoth Cave National Park
Mammoth Cave 42259-0027 (502) 758-2225
Mid-America Remote Sensing Center (MARC)
Murray State University, Murray 42071 (502) 762-2148
Owensboro Area Museum Planetarium
2829 South Griffith Avenue, Owensboro 42301 (502) 683-0296
Rauch Memorial Planetarium
University of Louisville, Louisville 40292 (502) 588-6665
Regional Airport Authority of Louisville and Jefferson County
P.O. Box 9129, Louisville 40209-9129 (502) 368-6524
The Jesse Stuart Foundation
P.O. Box 391, Ashland 41114 (606) 329-5233
Upward Bound & Educational Talent Search
Murray State University, Murray 42071 (502) 762-4327
Weatherford Planetarium
Berea College, CPO 1630, Berea 40404 (606) 986-9341 Ext. 6240

Colleges and Universities

Alice Lloyd College
Pippa Passes 41844 (606) 368-2101
Asbury College
Wilmore 40390 (606) 858-3511
Bellarmine College
Louisville 40205 (502) 452-8211
Berea College
Berea 40404 (606) 986-9341

Brescia College
Owensboro 42301 (502) 685-3131
Campbellsville College
Campbellsville 42718 (502) 465-8158
Centre College
Danville 40422 (606) 236-5211
Cumberland College
Williamsburg 40769 (606) 549-2200
Eastern Kentucky University
Richmond 40475 (606) 622-1000
Georgetown College
Georgetown 40324 (502) 863-8011
Kentucky Christian College
Grayson 41143 (606) 474-6613
Kentucky State University
Frankfort 40601 (502) 227-6000
Kentucky Wesleyan College
Owensboro 42302 (502) 926-3111
Lindsey Wilson College
Columbia 42728 (502) 384-2126
Midway College
Midway 40347 (606) 846-4421
Morehead State University
Morehead 40351 (606) 783-2221
Murray State University
Murray 42071 (502) 762-3011
Northern Kentucky University
Highland Heights 41076 (606) 572-5100
Pikeville College
Pikeville 41501 (606) 432-9200
Spalding University
Louisville 40203 (502) 585-9911
Thomas More College
Crestview Hills 41017 (606) 341-5800
Transylvania University
Lexington 40508 (606) 233-8300
Union College
Barbourville 40906 (606) 546-4151
University of Kentucky
Lexington 40506 (606) 257-9000
University of Louisville
Louisville 40292 (502) 588-5555
Western Kentucky University
Bowling Green 42101 (502) 745-0111

Other Resources

Community Colleges
Community education programs
Council for International Education
School clubs and organizations
State agencies
Vocational/technical schools

Environmental Resources

Audubon Society of Kentucky
284 Old Kingston Road, Lexington 40505 (606) 299-4105
Bernheim Forest
Highway 245, Clermont 40110-9999 (502) 585-3575
Department for Environmental Protection
18 Reilly Road, Ash Building, Frankfort 40601 (502) 564-3035
Department for Natural Resources
107 Mero Street, Frankfort 40601 (502) 564-2184
Geological Society of Kentucky
Morehead State University, Morehead 40351 (606) 783-2915
Kentuckians for the Commonwealth
26 Earl, P.O. Box 864, Prestonsburg 41653 (606) 886-0043
Kentucky Geological Survey
228 Mining & Mineral Resources Building, University of Kentucky, Lexington 40506-0107
(606) 257-5500
Louisville Zoo
1100 Trevilian Way, P.O. Box 37250, Louisville 40233 (502) 459-2181
Louisville Zoological Garden
1100 Trevilian Way, P.O. Box 37250, Louisville 40233 (502) 459-2181
Nature Preserves Commission
407 Broadway, Frankfort 40601 (502) 564-2886
Sierra Club
5304 Oak Creek Lane, Louisville 40212 (502) 452-8534
U.S. Department of Fish and Wildlife Service
600 Federal Place, Louisville 40202 (502) 582-5980

Kentucky State Parks

John James Audubon
P.O. Box 576, Henderson 42420-0576 (502) 826-2247
Barren River Lake
1149 State Park Road, Lucas 42156-9709 (800) 325-0057
Ben Hawes
Box 761, Owensboro 42302-0761 (502) 684-9808
Big Bone Lick
3380 Beaver Road, Union 41091-9627 (606) 384-3522

Blue Licks Battlefield
P.O. Box 66, Mt. Olivet 41064-0066 (606) 289-5507
Buckhorn Lake
HC 36, Box 1000, Buckhorn 41721-9602 (800) 325-0058
Carter Caves
Route 5, Box 1120, Olive Hill 41164-9602 (800) 325-0058
Columbus-Belmont Battlefield
P.O. Box 8, Columbus 42032-0008 (502) 677-2327
Cumberland Falls
7351 Highway 90, Corbin 40701-8814 (800) 325-0063
Dale Hollow Lake
6371 State Park Road, Bow 42714-9728 (502) 433-7431
Fort Boonesborough
4375 Boonesborough Road, Richmond 40475-9316 (606) 527-3131
General Burnside
P.O. Box 488, Burnside 42519-0488 (606) 561-4192
Grayson Lake
Route 3, Box 800, Olive Hill 41164-9213 (606) 474-9727
Green River Lake
179 Park Office Road, Campbellsville 42718-9351 (502) 465-8255
General Butler
Box 325, Carrollton 41008-0325 (800) 325-0078
Greenbo Lake
HC 60, Box 562, Greenup 41144-9517 (800) 325-0083
Jenny Wiley
HC 66, Box 200, Prestonsburg 41653-9799 (800) 325-0142
Kenlake
Route 1, Box 522, Hardin 42048-9737 (800) 325-0143
Kentucky Dam Village
P.O. Box 69, Gilbertsville 42044-0069 (800) 325-0146
Kincaid Lake
Route 4, Box 33, Falmouth 41040-9203 (606) 654-3531
Kingdom Come
P.O. Box M, Cumberland 40823-0420 (606) 589-2479
Lake Barkley
P.O. Box 790, Cadiz 42211-0790 (800) 325-1708
Lake Cumberland
5465 State Park Road, Jamestown 42629-7801 (800) 325-1709
Lake Malone
Dunmore 42339-0093 (502) 657-2111
Levi Jackson Wilderness Road
998 Levi Jackson Mill Road, London 40741-8944 (606) 878-8000
Natural Bridge
2135 Natural Bridge Road, Slade 40376-9701 (800) 325-1710
Old Fort Harrod
P.O. Box 156, Harrodsburg 40330-0156 (606) 734-3314

Paintsville Lake
150 Staffordsville 41256 (606) 297-1521
Pennyrile Forest
20781 Pennyrile Lodge Road, Dawson Springs 42408-9212 (800) 325-1711
Pine Mountain
1050 State Park Road, Pineville 40977-0610 (800) 325-1712
Rough River Dam
Route 1, Box 1, Falls of Rough 40119-9701 (800) 325-1713
Breaks Interstate Park
P.O. Box 100, Breaks VA 24607 (703) 865-4413

Many materials are available at no charge from the Kentucky Department of Travel Development. These materials include list of state parks and attractions, maps, area brochures, and information on specific sites. Materials are available on a limited basis. Requests need to be made in writing to the **Kentucky Department of Travel Development, P.O. Box 2011, Frankfort, Kentucky 40602-2011**.

Other Resources

Environmental and conservation organizations
Federal agencies
Nature centers or preserves
Parks (e.g., national, state, and city)

Health Resources

American Cancer Society
701 West Muhammad Ali Boulevard, P.O. Box 1807, Louisville 40201-1807
(502) 584-6782
American Diabetes Association
745 West Main Street, Suite 150, Louisville 40202 (502) 589-3837
American Heart Association
333 Guthrie Street, Suite 207, Louisville 40202-1899 (502) 587-8641
American Lung Association
P.O. Box 9067, Louisville 40209 (502) 363-2652
American Nursing Care Inc.
8172 Mall Road, Suite 238, Florence 41042 (606) 283-1500
Arthritis Foundation
3900-B Dupont Square South, Louisville 40207-4615 (502) 893-9771
Cystic Fibrosis
1941 Bishop Lane, Suite 507, Louisville 40218 (502) 452-6353
Dairy and Food Nutrition Council of Southeast, Inc.
901 Atkinson Drive, Suite 115, Louisville 40218 (502) 451-9837

Kentucky Association of Homes for the Aging
960 South 4th Street, Louisville 40203 (502) 635-6468
Kentucky Dental Association
1940 Princeton Drive, Louisville 40205 (502) 459-5373
Kentucky Domestic Violence Association
314 Wilkinson Boulevard, P.O. Box 356, Frankfort 40602 (502) 875-4132
Kentucky Medical Association
301 North Hurstbourne Parkway No. 200, Louisville 40222 (502) 426-6200
Kentucky Mental Health Association
Mall Office Building, Suite 357, 400 Sherburn Lane, Louisville 40202 (502) 893-0460
Kentucky Nurses Association
1400 South 1st Street, P.O. Box 2616, Louisville 40201 (502) 637-2546
Kentucky Optometric Association
514 Capitol Avenue, P.O. Box 572, Frankfort 40602 (502) 875-3516
Kentucky Pharmacists Association
1228 U.S. 127 South, Frankfort 40601 (502) 227-2303
Kentucky Psychiatric Association
P.O. Box 198, Frankfort 40602 (502) 695-4843
Leukemia Society of America
710 West Main Street, Suite 201, Louisville 40202 (502) 584-8490
Lupus Foundation
2210 Goldsmith Lane, Suite 209, Louisville 40218 (502) 459-6554
Mothers Against Drunk Driving
P.O. Box 1238, Frankfort 40602 (502) 875-1250
National Kidney Foundation of Kentucky
250 East Liberty, Suite 710, Louisville 40217 (502) 635-5433
National Multiple Sclerosis Society of Kentucky
982 Eastern Parkway, P.O. Box 12, Louisville 40217 (502) 636-1700 & (800) 873-6367
Parents Against Drug Abuse
2222 Alta Avenue, Louisville 40205 (502) 459-4424
Spina Bifida Association of Kentucky
982 Eastern Parkway, Louisville 40217 (502) 637-7363

Other Resources

Child-care centers
Family counseling agencies (e.g., Comp Care, abuse centers)
Family resource and youth service centers
Hospitals and clinics
Senior citizen assistance program
Support groups

Human Resources - Volunteer "Experts"

CampusServe
1050 U.S. 127 South, Suite 101, Frankfort 40601 (502) 564-3553
Kentucky Coalition of School Volunteer Organizations
1732 Capital Plaza Tower, 500 Mero Street, Frankfort 40601 (502) 564-8728
Kentucky Congress of Parents and Teachers, Inc.
314 Wilkinson Boulevard, P.O. Box 654, Frankfort 40602-0654 (502) 564-4378

Other Resources

Community members with expertise in crafts, recreation and other leisure activities, hobbies, or fitness
Ethnic families
Local celebrities
Senior citizens (e.g., retired individuals with time, energy, and skills serve as tutors and mentors to students)

Media Resources

Bloodlines
1-800-866-2361
Kentucky Broadcasters Association, Inc.
Radio Station Road, P.O. Box 680, Lebanon 40033 (502) 692-6888
Kentucky Educational Television
600 Cooper Drive, Lexington 40502 (606) 258-7100
Kentucky Press Association
101 Consumer Lane, Frankfort 40601 (502) 223-8821
Kentucky Thoroughbred Media
P.O. Box 11052, Lexington 40512

Other Resources

Magazines
Newspapers/newsletters
Radio stations
Television - public, commercial, and community access

Municipal Resources

Department of State Police
919 Versailles Road, Frankfort 40601 (502) 695-6300
Kentucky Association of Chiefs of Police, Inc.
Florence Police Department, Florence 41042 (606) 371-3927

Kentucky Association of Counties
400 King's Daughters Drive, Frankfort 40601 (502) 223-7667
Kentucky County Judge/Executives Association
400 Thistleton Terrace, Frankfort 40601 (502) 223-5293
Kentucky Festivals Association
2773 Bardstown Road, P.O. Box 371, Hodgenville 42748 (502) 358-4974
Kentucky Fraternal Order of Police
2100 Gardiner Lane, Louisville 40205-2900 (502) 452-2828
Kentucky League of Cities
2201 Regency Road, Suite 100, Lexington 40503 (606) 227-2886
Kentucky Magistrates/Commissioners Association
400 King's Daughters Drive, Frankfort 40601 (502) 223-7667
Kentucky Sheriffs Association
311 Burch Avenue, LaGrange 40031 (502) 222-7490
National Guard Association of Kentucky
1111 Louisville Road, Frankfort 40601 (502) 564-7500
State Board of Elections
Room 71, Capitol, Frankfort 40601 (502) 564-7100

Other Resources

Area development districts
Business Roundtable
City hall staff (e.g., mayor, town council, license bureau staff, voter registration personnel, tax assessors)
Governmental services (e.g., state and local law enforcement officers, firefighters, sanitiation personnel)
Judicial system (e.g., circuit and district court judges, Court of Appeals staff, Commonwealth Attorney)
Local legislators (senators and representatives)
Military installations
State agencies (e.g., Justice Cabinet, Administrative Office of the Courts, Cabinet for Human Resources)

Gold Book
The most complete source of information for the state of Kentucky regarding people and organizations. Sells for $20.00. Order through **Clark Publishing, Inc., P.O. Box 24766, Lexington, Ky 40524 (800) 944-3995.**

Additional Resources

ACTION

ACTION is the federal domestic volunteer agency. Its mission is to stimulate and expand voluntary citizen participation through the coordination of its efforts with public and private sector organizations and other governmental agencies. 1100 Vermont Avenue N.W., Washington, DC 20515 (202) 606-5256

Charles Stewart Mott Foundation

A leading innovator and funder of collaborative community and school programs. 4200 Mott Foundation Building, Flint, MI 48502 (444) 884-4000

Cities in Schools, Inc.

Sponsored by the U.S. Department of Justice, Health and Human Services, Labor, and Commerce, this organization seeks to create public-private partnerships to bring existing human resource services into schools where they can benefit youth at risk of dropping out of school. Cities in Schools offers fact sheets, brochures, newsletters, and training manuals. 401 Wyte Street, Suite 200, Alexandria, VA 22314 (703) 519-8999

National Association for Industry-Education Cooperation (NAIEC)

NAIEC advocates industry-education collaboration in school improvement, preparation for work through career education, and human resource and economic development. The association provides technical assistance in establishing formally structured industry-education councils composed of leaders in business, education, labor, government, and the professions. 235 Hendricks Boulevard, Buffalo, NY 14226-3304 (716) 834-7047

National Association of Partners in Education (NAPE)

NAPE is a membership organization representing schools, businesses, community groups, educators, and individuals who work together as partners to enhance the education of children. Materials and training for school-business-community relationships and volunteer and partnership initiatives are available. 209 Madison Street, Suite 401, Alexandria, VA 22314 (703) 836-4880

National Center on Education and the Economy

This organization was created to develop proposals for building the world class education and training system the United States must have if it is to have a world-class economy. The center conducts policy analysis and development, and it works collaboratively with others at the local, state, and national levels. 39 State Street, Suite 500, Rochester, NY 14610 (716) 546-6720

National Community Education Association (NCEA)

Founded in 1966, NCEA promotes and supports community involvement in public education, interagency partnerships, and lifelong learning opportunities for everyone in the community. The association publishes a journal, a newsletter, and other training materials and also provides technical assistance to communities. 801 North Fairfax Street, Suite 209, Alexandria, VA 22314 (703) 683-6232

National Dropout Prevention Center

This center seeks to reduce the nation's dropout rate by fostering public private partnerships in local school districts and communities across the country. It collects, analyzes, and disseminates information about such partnerships; provides technical assistance to develop and demonstrate dropout prevention programs; and maintains an online database of dropout prevention information called FOCUS. Clemson University, Clemson, SC 29634-5111 (800) 443-6392

National Mentor Network

Developed by the National Media Outreach Center with support from the U.S. Department of Labor, the National Mentor Network helps refer business volunteers interested in mentoring to schools in their area. Write or call for the names of contacts in your area and a list of print and video resources on mentoring. 4802 Fifth Avenue, Pittsburgh, PA 15213 (412) 622-1584/1491

National Society for Internships and Experiential Education (NSIEE)

This is an association of individuals, institutions, and organizations that promotes the effective use of experience as an integral part of education. Services include a bimonthly newsletter, publications, conferences, consulting services, and a clearinghouse of information related to experiential education and service-learning. 3509 Haworth Drive, Suite 207, Raleigh, NC 27609-7229 (919) 787-3263

National Youth Employment Coalition

This organization encourages information exchange between community-based organizations and corporations. It offers fact sheets, a bimonthly newsletter, directories, and reports related to youth employment and training issues. 1501 Broadway, Suite 1111, New York, NY 10036 (212) 840-1834

National Youth Leadership Council

A membership organization that promotes and supports service-learning. Membership benefits include receipt of a semi-annual journal, current information through a newsletter, a membership directory, and an annual report. The council also has a toll-free hot line for referrals and technical assistance. 1910 West Count Road B, Roseville, MN 55113 (612) 631-3672

Points of Light Foundation

The Points of Light Foundation is a private nonprofit, nonpartisan corporation established to help call the nation to engage in direct and consequential service focused on serious social problems and to translate this call into action through a variety of specific and catalytic strategies and programs. "Youth Engaged in Service" is their initiative focused on service by persons aged 5-25. 736 Jackson Place N.W., Washington, DC 20503 (202) 408-5162

StarServe

This national, non-profit organization provides materials, resources, and ongoing assistance at no cost to teachers and administratiors to make community service part of a class or school-wide activity. StarServe materials can help you and your students initiate service projects or enhance existing ones. They will provide a kit designed to offer specific ideas and activities for K-3, 4- 8, and 9-12. 701 Santa Monica Boulevard, Suite 220, Santa Monica, CA 90401 (800)-888-8232

Volunteer: National Center for Citizen Involvement

This membership organization encourages the exchange of ideas and information among volunteer program leaders through publications, training, and reference and information services. 1111 North 19th Street, Arlington, VA 22209 (703) 276-0542

Youth Service America

Dedicated to advancing the nationwide development of full-time service corps in states and localities, and community service programs based in secondary schools, colleges, and universities; to promoting the existing network of youth service programs nationwide; and to developing a permanent public mandate for youth service. 1319 First Street N.W., Suite 900, Washington, DC 20004 (202) 783-8855

Transformations:

Resources

Model Teaching Sites

Model Teaching Sites

The Model Teaching Sites section gives educators the opportunity to examine and receive information about unique and creative educational programs in Kentucky. This section was created in response to a Kentucky Education Reform Act (KERA) directive instructing the Department of Education to create a directory of model teaching sites.

The schools, selected as model teaching sites, submitted applications and were closely reviewed and examined by a committee of educators from across Kentucky. The evaluation committee found these programs replicable. The contact person is listed for each site if additional information is needed about these programs.

Ultimately, the success of KERA will be achieved through the efforts of schools and educators throughout Kentucky. We urge you to look at your own school and consider how one or more of these exemplary instructional programs might assist you in meeting the special needs of your students.

☆ = indicates primary category

✔ = supports primary category

Program	Transforming the Learning Environment	Alternative Ways of Learning	Integrated Curriculum	Standards-Based Instruction	Assessment Curriculum Connection	Community Resources	Alternative Uses of School Time	Technology Applications	Unique Instructional Strategies	Multicultural Education	Diverse/Exceptional Children
Barret Middle School Technology Program	✔	✔				✔		☆			
Bell County Middle School Cooperative Learning Model	✔	✔							☆		✔
Boyd County Family Resource Center-East						☆				✔	✔
Central High School Young Executive Management Program		✔				☆			✔		
Daviess County High School Entrepreneurship Class		☆				✔			✔		
Emerson High School Teenage Pregnancy Program	✔					✔					☆
Greenwood High School A.P.E. Program		✔	☆				✔				
Hancock County High School TECH Prep Program		✔	✔	☆				✔			
Highlands High School American Studies		✔	☆	✔	✔		✔	✔			
Meece Middle School Eco-Check Bioassessment Program		✔	☆			✔					
Murray Independent Schools Volunteer Program	✔					☆	✔				
Roosevelt Perry Elementary Integrated Technology Program	✔							☆	✔		
Seneca High School Humanities Based Curriculum	☆	✔	✔			✔		✔	✔	✔	
Warfield Elementary Student Involvement Program		✔				☆	✔				
Washington County Elementary Portfolio Partners		☆			✔		✔	✔	✔		
Williamsburg Independent Schools	☆	✔		✔		✔		✔	✔		

Barret Traditional Middle School

Jefferson County Schools
Technology Program

Overview: *Technology is the cornerstone of the school's curriculum.*

The technology program at Barret Traditional Middle School demonstrates how teachers, administrators, and parents can work together to incorporate technology into model teaching practices. Students in all grades learn and use a variety of computer skills in all subject areas. Sixth graders master basic skills from keyboarding to spreadsheets. Seventh graders participate in a three-week immersion program where laptops replace traditional paper and pencil operations. Eighth graders conduct and present research using software. Computers are used to write and edit assignments; create science and social studies databases, graphs, and spreadsheets; and create projects that integrate the arts, humanities, and sciences.

Although a grant provided funds for some equipment, the commitment of students, teachers, administrators, and parents makes the program work. In addition to attending regular training sessions, teachers have modified schedules which allow a staff member to serve as a computer specialist. The principal has integrated technology into many administrative activities. Parents attend evening workshops to become familiar with the program, and a recent partnership forged with a local hospital will enable students to use newly acquired computer skills in a real-world setting.

Contact Person: **Kenwyn Wise**
Barret Traditional Middle School, 2561 Grinstead Drive, Louisville, KY 40206
502-473-8207

Bell County Middle School

Cooperative Learning Model

Overview: *A cooperat[illegible]arning model is used to enhance academic and affective skills.*

A cooperative learning model has been adopted for use in a variety of instructional programs at Bell County Middle School. The goals of the cooperative learning model include the following:

- improve academic achievement;
- improve social skills;
- eliminate social barriers;
- assist mainstreaming of students with disabilities; and
- provide an alternative to ability grouping and tracking.

The model is introduced to the students by first explaining how positive reinforcement facilitates and encourages the communication of ideas. Students are given opportunities to practice positive reinforcement skills and then are given academic tasks which require them to problem solve. As part of the model, they are asked to explain and defend their solutions to the rest of the class. The students in the audience analyze the solution to the task and offer opinions and suggestions for improvements. Audience responses have to be stated in positive terms. This technique effectively combines an academic task with a strategy for improving social skills.

This model is flexible enough to be used with a variety of instructional situations. For example, it has been used in a team-teaching format in which pre-algebra and special education classes were combined, and by individual teachers in a variety of classes.

During the last two years of this program's existence, 100% of the students have participated in oral presentations. Positive reinforcement and constructive comments create a non-threatening environment in which students feel comfortable and secure in making presentations before their peers. As a result of this project, significant positive effects on academic and interactive skills have been demonstrated in many classroom environments.

Contact Persons: **Stephen Baxter or Teresa Lasley**
Bell County Middle School, Rt. 1, Box 87C, Pineville, KY 40977 / 606-337-3104

Central High School

Jefferson County Schools
Young Executive Management Program

Overview: *Entrepreneurship curriculum allows students to operate a business.*

The Young Executive Management Program at Central High School combines an entrepreneurship-focused curriculum with student management and operation of a business. The curriculum for the Young Executive Management Program is consistent with the Kentucky Education Reform Act in that it encourages the development of skills in teamwork, problem solving, integration of knowledge, leadership, and communication.

A mobile restaurant unit is provided by KFC, Corp. (Kentucky Fried Chicken) and profits from the student-run restaurant are channeled into a scholarship fund for students actively involved in the program. KFC executives feel that the project has developed into one of the top corporate public-school partnerships in the country.

The Young Executive Management Program, an example of successful business-school partnerships, could be replicated in other schools on a large or small scale. "Regardless of the size of the business endeavor, the skills and knowledge gained by the students will be very valuable," said project coordinator, Linda Neal.

Contact Person: **Linda Neal, Project Coordinator**, Young Executive Management Program
Central High School, 1130 W. Chestnut Street, Louisville, KY 40203 / 502-473-8226

Daviess County High School

Entrepreneurship Class

Overview: *Students gain self-esteem and confidence through participation in a small business project.*

The Entrepreneurship class at Daviess County High School is an elective business course which involves students in the decision-making process of setting up a small business project. Selling stock, forming a corporation, electing a board of directors, obtaining a bank loan, preparing financial statements, delegating job responsibilities, and manufacturing hand-made items allow the students to participate in real-life educational experiences. Career development is integrated into the class as students complete job application papers such as a resume' and employment application forms. The project also allows students to gain valuable experiences and insights into their personal entrepreneurial characteristics.

While the students enjoy participating in their business, they are actively engaged in a valuable experience which stresses decision-making, problem-solving, and interpersonal skills. All of these skills are extremely important facets of KERA.

Although the project was a resounding success, there were a few mistakes; however, these mistakes turned out to be meaningful learning experiences. "I've always wanted to teach my students that, although they may encounter problems and obstacles in life, they need to maintain a positive attitude and keep moving forward," said Gay Burden, teacher of the Entrepreneurship class. "The best thing that resulted from this project was the improvement in my students' self-esteem and confidence. It gave them the opportunity to be successful."

Contact Person: **Gay Burden**
Daviess County High School, 4255 New Hartford Road, Owensboro, KY 42301 / 502-684-5285

Eidson Elementary

Boyd County Schools
Boyd County Family Resource Center - East

Overview: *Community resources eliminate barriers to learning.*

As is the goal of all resource centers, the Boyd County Center has developed a range of services to eliminate barriers to learning that are unique to the community. Because problems vary from community to community, no two centers are likely to create the same set of solutions.

The center has had a dramatic and positive effect on instruction and learning due to its outreach efforts. For example, the center worked with a local housing project to provide tutoring for parents which included parenting skills, infant CPR, and GED instruction. Additionally, the center provided an after-school academic tutoring program for students in the project. School attendance rates increased after the tutoring program started, and it was felt that the center's efforts were related to this positive result. A recently developed center program, Volunteer In-school Program (VIP), has provided over 1,400 hours of volunteer assistance to classrooms in the three elementary schools served.

The Boyd County Family Resource Center - East, which also serves Catlettsburg and Ponderosa Elementary Schools, is located in an Eidson Elementary school classroom. It has been renovated with sofas and other "homey" touches to make parents and students feel welcome. The center provides opportunities for both the students and their parents. Programs in childcare, nurturing, and education for the young child are common. Transportation is available if needed.

By "...meeting a child's basic needs, (we) can increase his/her chances to succeed in school," said Norma Meek, Director of the Boyd County Family Resource Center - East. "We intend to access all available resources in our community for all the families who need us. Enthusiasm, commitment, and caring continue to be terms not taken lightly by our center, as we work toward improving lives so children can succeed." This center is an outstanding example of schools effectively connecting with the community for the improvement of education for all students.

Contact Person: **Norma Meek, Director**, Boyd County Family Resource Center - East
Eidson Elementary, 5701 Catletts Creek, Catlettsburg, KY 41129 / 606-739-4445

Emerson High School

South Park High School
The Jefferson County Teenage Pregnancy Program

Overview: *A special-needs program enables at-risk students to graduate.*

Kentucky's dismal rate of teenage pregnancy has been responsible for increased absenteeism and high dropout numbers throughout the state. Jefferson County has responded to this situation by developing the Teenage Pregnancy Program (TAPP). Housed on two regional campuses, the TAPP program is targeted for pregnant girls who are at risk of dropping out.

Teaching strategies targeting problem-solving and decision-making skills have been developed by this committed staff in an attempt to reach the at-risk student population. These strategies are woven throughout the school's curriculum in an effort to reinforce student learning in special courses such as Childcare and Nutrition.

Additionally, innovative programs allow teachers the opportunity to keep students motivated and interested in learning. For example, day care facilities at both campuses afford unique teaching opportunities for real-life and vocational education. In-school medical facilities have been used to both decrease absenteeism and provide students with essential medical instruction.

The basic philosophy of KERA, that all children can learn at high levels, is exemplified by the TAPP program. An innovative, energized, engaged staff is determined to provide a quality and practical education for students. By viewing each student as an unique individual, the staff has created a learning environment which could be adapted for schools throughout Kentucky.

Contact Person: **Georgia Chaffee, Principal/Director**
Emerson High School, 1100 Sylvia Street, Louisville, KY 40217 / 502-473-8245

Greenwood High School

Warren County Schools
The A.P.E. Program

Overview: *An integrated, thematic program involves algebra, physics, and English (A.P.E.).*

The A.P.E. program is a three-hour block of integrated study including Algebra II, Physics I, and English III for junior students at Greenwood High School in Warren County. Teachers and students gather in a triad of rooms which include a science lab large enough to accommodate the whole group. The block of time available is arranged according to the needs of the students allowing them to participate in a variety of thematic activities. They explore concepts through group projects, skits and role-playing, field studies, videotaping, exploration of learning styles, and journal writing.

In keeping with the KERA philosophy of using all available resources, instructors have strongly encouraged students to use their "human resources" of peers, parents, and community. The students find that these resources are invaluable in their work on thematic activities. As a result, they see how people can work together to create solutions and solve problems.

Contact Person: **Sandra Taylor**
Greenwood High School, 5065 Scottsville Road, Bowling Green, KY 42104
502-842-3627

Hancock County High School

Tech Prep Program

Overview: *Tech Prep Program is an integration of academic and vocational instruction.*

Although 52% of Hancock County graduates attend college, educators and citizens wanted to assure that the other 48% would be qualified to obtain some of the many industrial jobs available in the area. A local task force, representing government, industry, and education, recommended increased emphasis be placed on vocational guidance, new technology, and integration of academic and vocational education. Additionally, systematic activities are implemented P-12 to provide students insight into their job interests, personal capabilities, and available opportunities.

"It's rewarding for me to see teachers who are so excited about teaching in this program," said Dr. Ann Evans, Instructional Supervisor of Hancock County Schools. The Tech Prep Program is a standards-based project that integrates an academic and vocational class at each grade level 9-12. A seven-period school day facilitates the scheduling of the integrated classes. A mastery learning model incorporating multiple-intelligence theory is also a component of this project. In summing up the program, Dr. Evans said, "Our community appreciates the dedication and effort of the teachers and the principals involved in the Tech Prep Program. Their commitment makes it work!"

Contact Person: **Dr. Ann Evans, Instructional Supervisor**
Hancock County Board of Education, P.O. Box 159, Hawesville, KY 42348
502-927-6914

Highlands High School

Ft. Thomas Independent Schools
American Studies

Overview: *Integrated instruction results in a multifaceted study of American society and culture.*

The American Studies classes at Highlands High School include the subjects of American literature, history, art, and music. The student-centered course emphasizes the societal changes in America as witnessed by the many diverse cultures of our society. Students participate in an array of learning experiences which include writing in a variety of modes, participating in oral projects, producing video and slide shows, holding debates, and engaging in projects that will appeal to each student's special interest and talent.

The teachers have developed a unit entitled "Take Me Out To The Ballgame" which focuses on the historical and literary impact of baseball on American society. They selected essays, poetry, and readings from texts; and they used slides and a video from the Baltimore Art Museum's exhibit, "Diamonds Are Forever," along with another video, "Baseball Goes To War." This unit was shared with other teachers who suggested ways it could be expanded into math, science, business, and other areas.

Students in the American Studies class are heterogeneously grouped. The two-hour block class allows the students the opportunity to achieve the rigorous standards which are established in the course. An "I" (incomplete) rather than an "F" (failure) is recorded on report cards when work is unfinished. Therefore, the responsibility for learning lies with the student. "One very desirable result of this program is that there have been fewer discipline problems, and student motivation has increased," said Dennis Chandler, teacher.

Each team of American Studies teachers has its planning period together which aids in class planning as well as student evaluation. Teacher collaboration has been an essential component of the course.

Contact Persons: **Dennis Chandler or Linda Johnson**
Highlands High School, 2400 Memorial Highway, Ft. Thomas, KY 41075
606-781-3333

Meece Middle School

Somerset Independent Schools
ECO-CHECK Bioassessment Project

Overview: *The outdoor environment is transformed into a learning laboratory for seventh-grade biology students.*

The Kentucky Education Reform Act emphasizes providing real-life experiences. Seventh-grade biology students at Meece Middle School have literally used the school's backyard and nearby areas to create a new classroom.

In a unit entitled "Eco-Check," students applied concepts learned earlier. They collected insect, tree, and wildflower species while on a field study to a nearby stream. Additionally, they conducted a bioassessment of the stream itself. This unit expanded into other curricular areas. Pollution levels were studied and calculations completed in math classes; the history of the streams was studied in social studies classes; and written assignments on the project were completed in English classes.

"Students need to learn that we live in a very complex and fragile world. The more we learn about its plants and animals, the better stewards we will become. I wanted my students to look at all of nature as a classroom," commented Thomas Floyd, teacher of the class and designer of the unit.

This project is an excellent example of using readily available resources to create meaningful, hands-on learning experiences. As one of the students said, "Usually we just have to stay in our classrooms. Now we go outside and really study living things instead of looking at pictures in a book."

Contact Person: **Thomas G. Floyd**
Meece Middle School, 210 Barnett Street, Somerset, KY 42501 / 606-678-5821

Murray Independent Schools

Volunteers and School-Business Partners Program

Overview: *This community resources program enhances the learning environment.*

Utilizing community resources effectively for the benefit of all students P-12 is exemplified by Murray's Volunteers and School-Business Partners Program. Volunteer instructors - adults and students - contribute their personal time, expertise, and commitment to help create a positive teaching-learning environment for the students. Jean Bennett, Program Coordinator states, "Eighty-seven percent of our students attend college upon graduation from Murray High School. We credit the dedication of our many volunteer instructors, plus the commitment of our business partners as contributing factors to these statistics."

The volunteer instructional program is in its seventh year. More than 600 members of the community contributed their time and energies in one school year alone. Volunteer instructors teach in a variety of classroom settings including individualized instruction and group tutorial sessions; after-school creative-writing and problem-solving courses; and in-school classes such as art. High school band members enthusiastically volunteer to teach marching band skills to middle school students, and foreign language students volunteer to teach different languages to primary students.

The district has made a decision to use discretionary funds to support the program and the coordinator's salary. "The success of this program has been the direct result of placing the program responsibilities in the hands of a director who has no other major responsibilities," said Assistant Superintendent Willy Jackson.

Contact Person: **Jean Bennett, Director**, Community Education
Murray Independent School District, Poplar at 9th, Murray, KY 42071 / 502-753-4363

Roosevelt-Perry Elementary

Jefferson County Schools
Integrated Technology Program

Overview: *Technology is used as a teaching tool.*

Colorful computer murals at the entrance to Roosevelt-Perry Elementary School make you feel as though you have just entered the "technology zone." In fact, you have. Roosevelt-Perry is using technology as an instructional tool. A visit to the school would highlight the following:

- all ages engaged in desktop publishing;
- laptop computers used by multiage groups in the classroom and on field studies;
- laptop computers checked out for overnight use by students;
- global telecommunications used to exchange information with students in other countries; and
- electronic encyclopedias used for research in the library.

As Roosevelt-Perry principal, J.W. Back, explained the school's programs, he said, "Our school's vision materialized because we had the commitment of staff to train continuously, to take risks, and to seek and create quality learning experiences. We obviously have a challenge to lead our community into a future of high technology. However, our challenge is less expensive than living with the consequences of our failure. We will create a successful future with our vision for Roosevelt-Perry."

Contact Person: **J.W. Back, Principal**
Roosevelt-Perry Elementary, 1606 Magazine Street, Louisville, KY 40203 / 502-473-8318

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Seneca High School

Jefferson County Schools
Humanities-Based Curriculum

Overview: *A humanities-based curriculum encourages interdisciplinary collaboration.*

The Seneca administration and faculty are working together to provide a wide variety of active humanities-based programs and projects for their diverse student body. A partial listing of these programs includes:

- musical theatre where students are involved in all the production processes;
- ethnic lunches planned, prepared, and served by students to students and faculty;
- agricultural science program which involves active business projects;
- technology center which houses the most current programs and equipment;
- integrated teaching across the disciplines; and
- publications of student writing.

While other Kentucky high schools offer many of these programs, the unique leadership provided by the principal encourages collaborations and experimentation. A non-threatening, disciplined atmosphere allows the faculty and students to achieve a high level of success.

Seneca High School has used the talents of its student body and educators to create a curriculum which celebrates diversity. Instructional planning includes both students and teachers, and as a result, learning is an exciting and rewarding experience.

Contact Person: **John Locke, Principal**
Seneca High School, 3510 Goldsmith Lane, Louisville, KY 40220 / 502-473-8323

Warfield Elementary

Martin County Schools
Student Involvement Programs

Overview: *Special programs and projects involving students result in increased student motivation.*

"We will not allow any student to fail at Warfield Elementary," said principal, Estella Horn. She went on to clarify her statement by explaining the numerous programs and projects sponsored by the school in order to create a positive learning environment. The programs include science fairs, dramatic presentations, career day, monthly assemblies conducted by students, academic teams, and many others. The result is that 99% of the student body participates in some activity, and 100% receives some type of award or recognition during the school year.

The student projects and programs are so varied and numerous, that there is something for everyone. Since students are involved and excited about these programs, attendance rates have increased dramatically in recent years.

Warfield Elementary has created an excellent example of a student-centered program that is designed to meet the needs of the population. The programs do not require large expenditures but they do require planning, organization, and the commitment of the administration and faculty.

Contact Person: **Estella Horn, Principal**
Warfield Elementary, HC 69 Box 180, Warfield, KY 41267 / 606-395-5121

Washington County Elementary

Portfolio Partners

Overview: *Secondary students tutor elementary students in a multiage peer-tutoring program.*

Senior English classes at Washington County High School are teamed with fourth grade students to improve student writing skills for portfolio development. In a mentoring format, the seniors work with the younger students to draft, revise, edit, and publish their works. The seniors plan and provide computer instruction for the fourth graders and provide an audience for completed works. The relationships which develop among the students are non-threatening and create a nurturing, productive environment. As students assume responsibility for their own learning, the teachers become facilitators and coaches.

Although this particular program was easily established because of the proximity of the facilities, any school which houses multiage classrooms could modify this format to meet the needs of the students. The Washington County program has been successful because the professionals at both schools were able to modify their curricula and utilize the resources available. It is built on creativity, flexibility, and the willingness to establish new paradigms in the areas of alternative uses of school time, transforming the learning environment, unique instructional strategies, and application of technology in the classroom.

Contact Person: **Pauletta Kutter, Principal**
Washington County Elementary, Lincoln Park Road, Springfield, KY 40069
606-336-5490

Williamsburg Elementary and High School

Williamsburg Independent Schools
Transforming the Learning Environment

Overview: *Multiple KERA initiatives impact a district's approach to education.*

The Williamsburg Independent School District is transforming the learning environment through a variety of strategies applied at elementary, middle, and high school levels. The use of technology permeates the schools. Every classroom has access to one or more networked computer work stations complete with a large-screen projection device. Students and teachers use two special-purpose networked computer labs, a thirty-two station multiuse lab, and a writing center. Students produce a weekly video news program aired throughout the school via closed-circuit cable. High school students host a monthly school district television production that is aired throughout the community.

The community is an important resource for the instructional program. A "Celebrity Readers" program brings adults into the classrooms throughout the school year. Residents of Williamsburg share their talents and knowledge with students in an "After Hours" enrichment program.

Superintendent Jim Simpson states, "I continue to be amazed at how much of the Kentucky Education Reform Act actually reaches into classrooms to touch the lives of our children and youth." He gives credit to his "...talented, forward-thinking, professional staff which has devoted countless hours to a restructured school system that focuses exclusively on student learning."

Contact Persons:

Jerry Hodges, Principal
Williamsburg High School
1000 Main Street
Williamsburg, KY 40769
606-549-6044

Gary Pate, Principal
Williamsburg Elementary School
1000 Main Street
Williamsburg, KY 40769
606-549-6044

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Resources

Key Readings

Key Readings

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